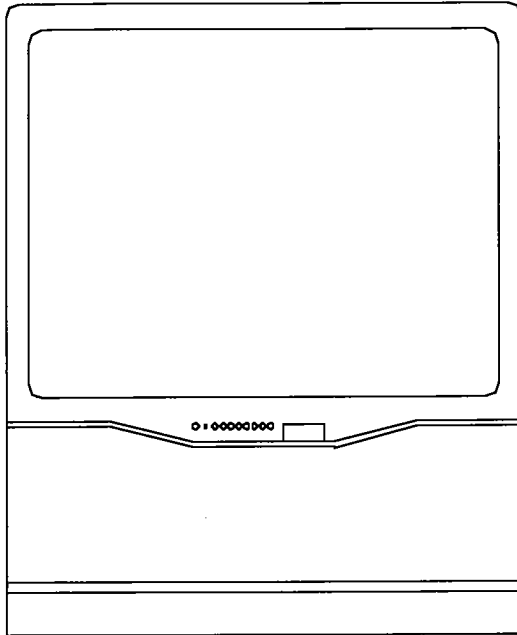




Service Manual

PROJECTION TELEVISION
VZ4 CHASSIS



MODEL
VS-45501/VS-45502/VS-45501A
VS-50501/VS-50502/VS-50501A

CAUTION:

Before servicing this chassis, it is important that the service person read the "SAFETY PRECAUTIONS" AND "PRODUCT SAFETY NOTICE" in this manual.

SPECIFICATIONS

- | | |
|---|--|
| <ul style="list-style-type: none"> • Power Input : AC 120V, 60Hz • Power Consumption : 260W • Frequency Range : VHF 54 ~ 470MHz
UHF 470 ~ 806MHz • Antenna Input : VHF/UHF 75 Ω unbalanced
Single axis input • CRT : [VS-45501/45502] [VS-45501A]
180DLB22 (R) 180DLB22 (R)
180DLB22 (G) 180DLB22 (G)
180DLB22 (B) 180DLB22 (B) | <ul style="list-style-type: none"> • High Voltage : 32.0kV (at 0A) • Speaker : 4" round type 2 pcs. • Cabinet Dimensions : [VS-45501/ 45502/V45501A]
: 39.5"(W) X 49"(H) X 23.4"(D)
: [VS-50501/50502/50501A]
43.5"(W) X 51.2"(H) X 24.3"(D) • Weight : [VS-45501/45502/45501A] 190 lbs
[VS-50501/50502/50501A] 195.8 lbs • Input Level : VIDEO IN JACK (RCA Type)
1.0Vp-p 75 Ω unbalanced
: AUDIO IN JACK (RCA Type)
-3 dBm 43kΩ unbalanced
: S-VIDEO IN JACK
(Y/C separate type)
Y: 1.0 Vp-p C: 0.286Vp-p(BURST)
75 Ω unbalanced |
| <ul style="list-style-type: none"> [VS-50501] [VS-50501A]
P16LJK01RJA (R) P16LHV08RJA (R)
P16LJK01HKA (G) P16LHV08HKA (G)
P16LJK01BMB (B) P16LHV09BMB (B) [VS-50502]
P16LFM00RFA (R)
P16LFM00HLA (G)
P16LFM00BMB (B) | <ul style="list-style-type: none"> • Output Level : VIDEO OUT JACK (RCA Type)
1.0Vp-p 75 Ω unbalanced
: AUDIO OUT JACK (RCA Type)
-3 dBm 4.7 KΩ unbalanced |

- Weight and dimensions shown are approximate.
- Design specifications are subject to change without notice.

MITSUBISHI CONSUMER ELECTRONICS AMERICA, INC.

6100 Atlantic Blvd., Norcross, GA. 30071-1305

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CONTENTS

INTRODUCTION.....	3
SAFETY PRECAUTIONS.....	4
DISASSEMBLY/FRONT AND REAR CABINET COMPONENTS.....	5
SERVICING PCBs.....	6
PCB Locations.....	6
Extension Cord Jigs Table.....	6
SERVICING OF THE LENTICULAR SCREEN AND FRESNEL LENS.....	7
Removal of the Lenticular Screen and Fresnel Lens.....	7
Installation of the Lenticular Screen and Fresnel Lens.....	8
CRT REPLACEMENT.....	10
Removal of the CRT.....	10
Installation of the CRT.....	11
Adjustment procedures after replacing the CRT.....	12
ELECTRICAL ADJUSTMENTS.....	13
Location of Test Points and Adjustments.....	14
Initial Set Up.....	16
Circuit Adjustment Mode.....	18
When Replacing EEPROM (IC701).....	20
List of Adjustment Items.....	20
Adjustment procedures.....	24
Multi Channel Sound Circuit.....	24
High Voltage Control Circuit.....	25
CRT Circuit.....	26
Focus Circuit.....	27
Video Circuit.....	28
Horizontal and Vertical Deflection Circuits.....	29
Raster Correction Circuit.....	30
Screen Character Circuit.....	31
Convergence Circuit.....	31
PIP Circuit.....	34
CHIP PARTS REPLACEMENT.....	36
PARTS LIST.....	37
ELECTRICAL PARTS AND OTHERS.....	37
LEAD DRESS.....	46
SIGNAL PATH DIAGRAMS.....	48
IC BLOCK DIAGRAMS.....	50

INTRODUCTION

This service manual provides service instruction for PTV Models: VS-45501, VS-45502, VS-45501A, VS-50501, VS-50502 and VS-50501A which use the VZ4 Chassis. Service personnel should read this manual thoroughly before servicing this chassis.

This service manual includes:

1. Assembly and disassembly instructions for the front and rear cabinet components
2. Servicing of the lenticular screen and fresnel lens.
3. Servicing printed circuit boards (PCBs).
4. CRT replacement procedure.
5. Electrical adjustments.
6. Chip parts replacement procedures.
7. Lead dress diagram.

The parts list section of this service manual includes:

1. Cabinet and screen parts.
2. Electrical parts.

Schematic and block diagrams of PTV Models: VS-45501, VS-45502, VS-45501A, VS-50501, VS-50502 and VS-50501A are included in this service manual for better understanding of the circuitry. PCB drawings are also included for easy location of parts and test points.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc.

Replacement parts which have special safety characteristics are identified in this service manual.

Electrical components having such features are identified by shading on the schematic diagram and on the parts list of this service manual, and by marking on the supplementary sheet for this chassis to be issued subsequently. Therefore, the replacement for any safety part should be identical in value and characteristics.

SAFETY PRECAUTIONS

NOTICE: Observe all cautions and safety related notes located inside the receiver cabinet and on the receiver chassis.

- WARNING:**
1. Operation of this receiver outside the cabinet or with the cover removed presents a shock hazard from the receiver's power supplies. Work on the receiver should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment.
 2. Do not install, remove or handle the picture tubes in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while the picture tube is being handled. Keep the picture tube away from the body while handling.
 3. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage area. Where a short-circuit has occurred, replace those components that indicate evidence of overheating.

B. X-radiation warning

The surface of the cathode ray tubes (CRTs) may generate X-Radiation, so take proper precautions when servicing. It is recommended that a lead apron be used for shielding while handling the CRT. Use this method if possible. When replacing the CRTs, use only the designated replacement part since it is a critical component with regard to X-Radiation. As noted above, no high voltage adjustments are provided. The high voltage specification is described on the cover page.

C. Leakage current check

Before returning the receiver to the customer, it is recommended that leakage current be measured according to the following methods.

1. Cold Check

With the alternating current (AC) plug removed from the AC source, place a jumper across the two AC plug prongs. Connect one lead of an ohm meter to the AC plug and touch the other lead to each exposed metal part (i.e. antennas, handle bracket, metal cabinet, screw heads, metal overlay, control shafts, etc.), particularly any exposed metal part that has a return path to the chassis. The resistance of the exposed metal parts having a return path to the chassis should be a minimum of 1Mega Ohm. Any resistance below this value indicates an abnormal condition and requires corrective action.

2. Hot Check

Use the circuit in Figure 1 to perform the hot check test.

1. Keep switch S1 open and connect the receiver to the measuring circuit. Immediately after connection, and with the switching devices of the receiver in their operating positions, measure the leakage current for both positions of switch S2.
2. Close switch S1, energizing the receiver. Immediately after closing switch S1, and with the switching devices of the receiver in their operating positions, measure the leakage current for both positions of switch S2. Repeat the current measurements of items 1 and 2 after the receiver has reached thermal stabilization. The leakage current should not be more than 0.5 milliamperes (mA).

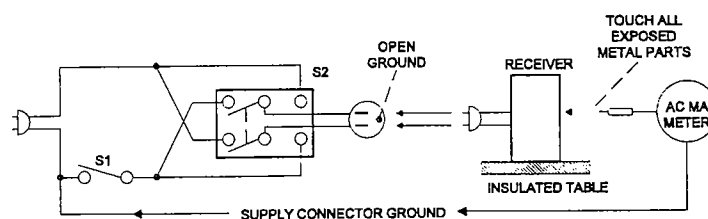
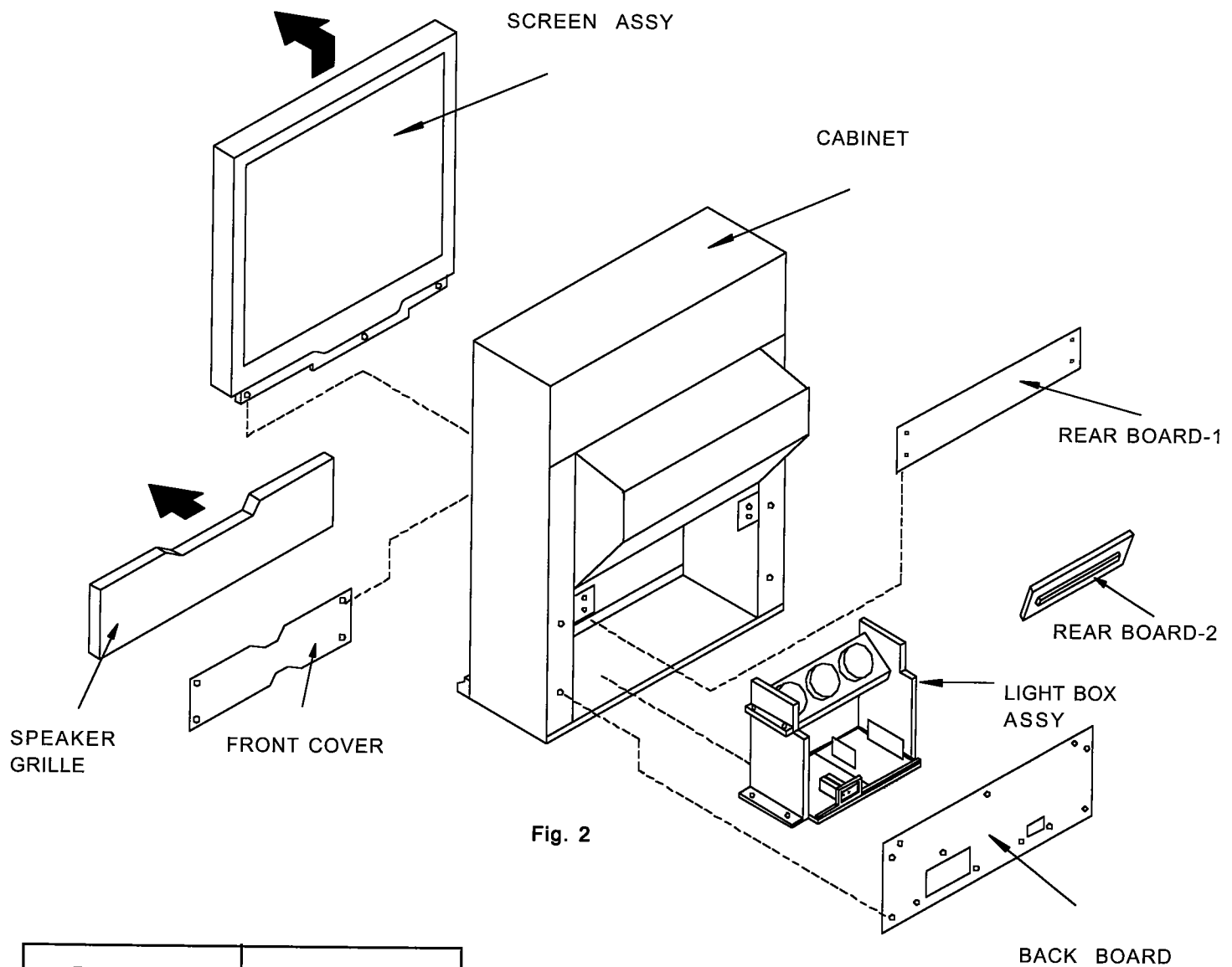


Figure 1

DISASSEMBLY/ FRONT AND REAR CABINET COMPONENTS

*Refer to PARTS LIST for Part Numbers



Parts Name	Number of Screws
Screen Assy	3
Front Cover	4
Rear Board-1	4
Rear Board-2	2
Back Board	12
Light Box Assy	8

Table 1-2

SERVICING PCBs

PCB Locations

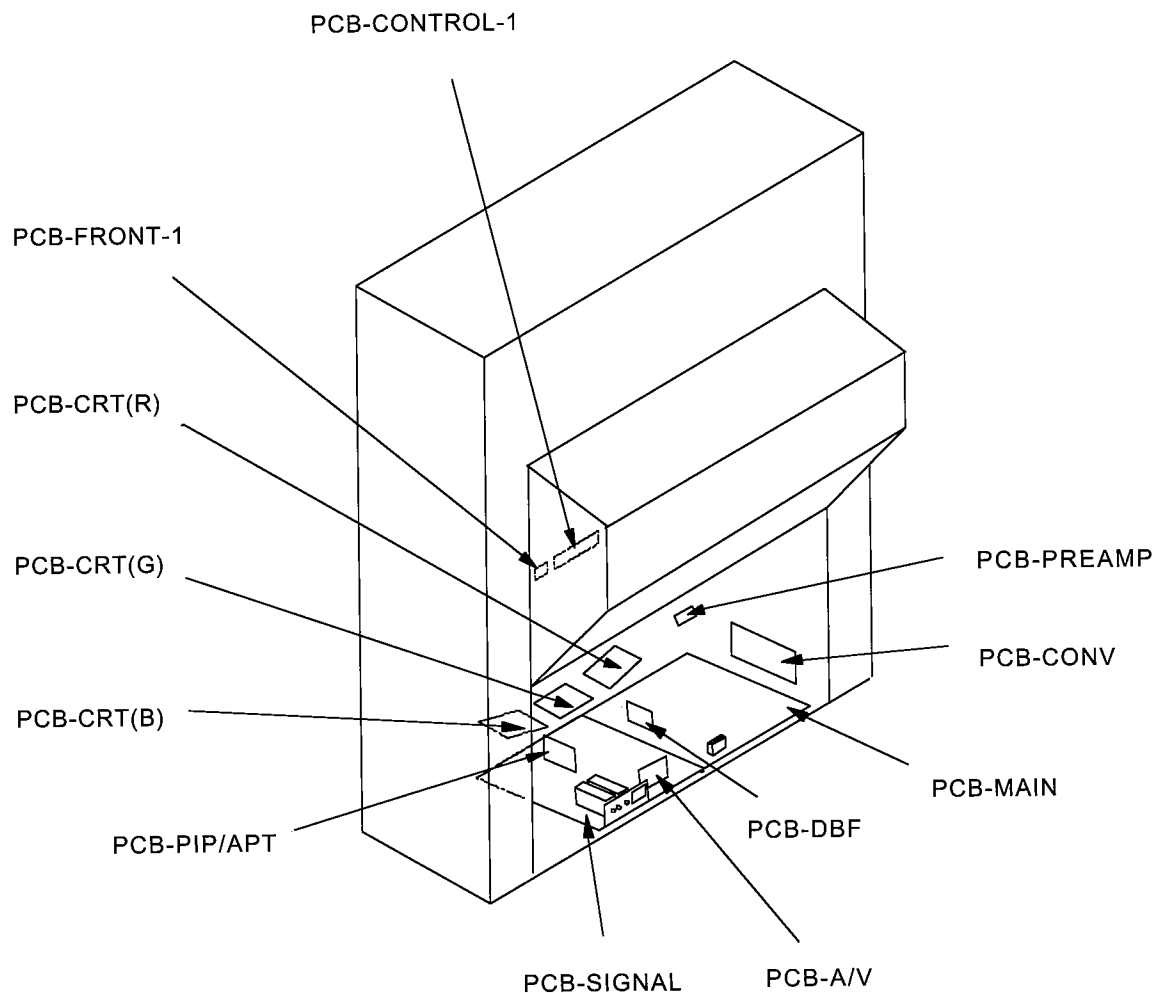


Fig. 3

Extension Cord Jigs Table

When servicing PCBs, use the Extension Cord Jigs for easier access.

PRINTED CIRCUIT BOARD	CONNECTOR	PART NUMBER
DBF	DV (3 PIN)	859C431060
DBF	DW (5 PIN)	859C432060
DBF	DU (7 PIN)	859C431070
PIP	GE (9 PIN), GF (9 PIN)	859C432050
A/V	GB (13 PIN)	859C432030
A/V	GA (11 PIN)	859C432040

* Extension Jigs for servicing of the PCB-Convergence are not listed as the existing leads are of sufficient length.

Table 2

SERVICING OF THE LENTICULAR SCREEN AND FRESNEL LENS

1. Removal of the Lenticular Screen and Fresnel Lens

A. VS-45501/VS-50501

1. Remove the screen assembly as shown in figure 2.
2. Remove Frame Holder by removing 12 screws (a).
3. Remove Screen Holder by removing 6 screws (b).

Note: When separating the Lenticular Screen from the Fresnel Lens, use caution while prying the Screen and Lens apart using a slot type screw driver, and remove the pressure sensitive, double sided tape.

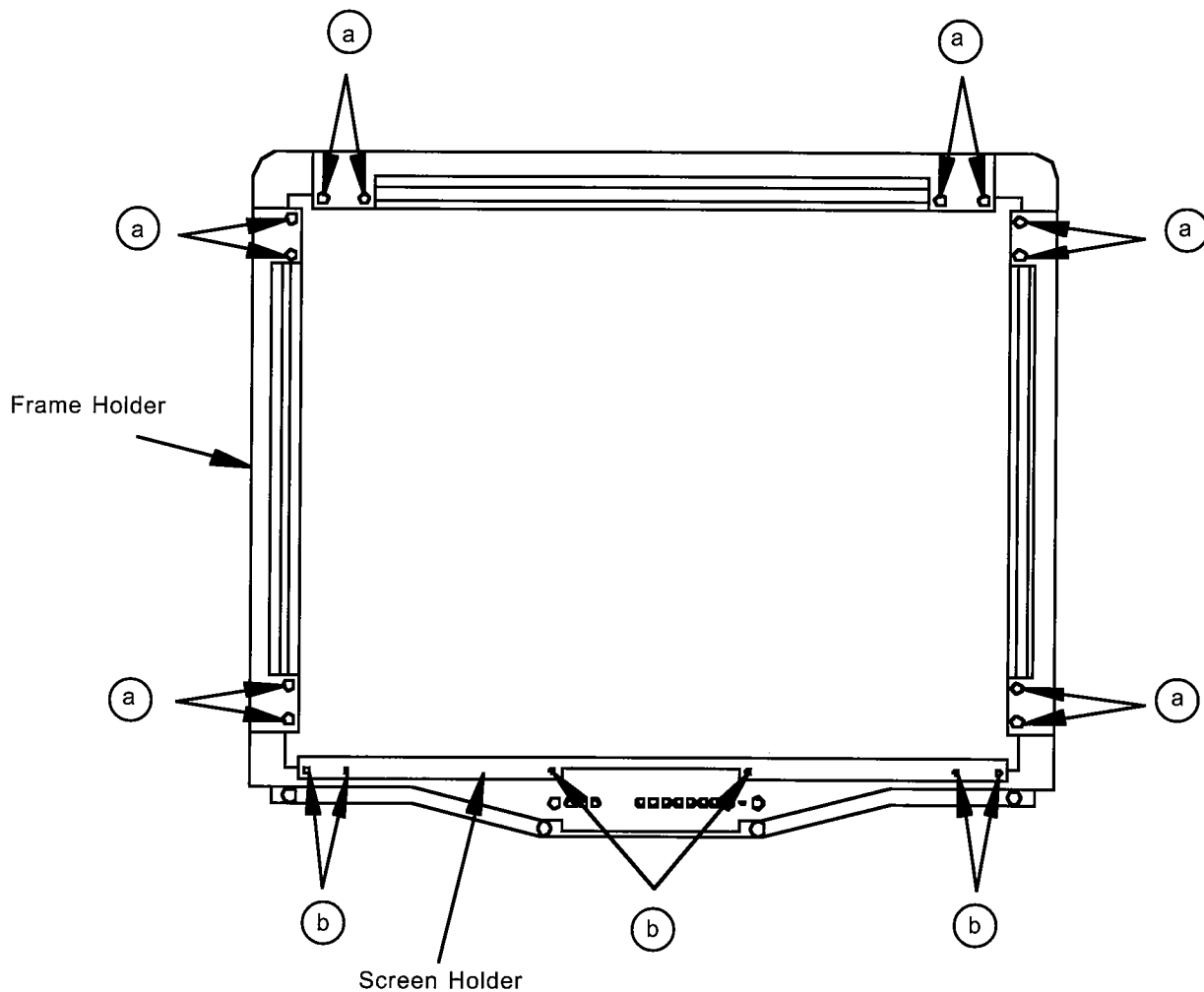


Figure 4-1

2. Installation of the Lenticular Screen and Fresnel Lens

CAUTION: WEAR GLOVES WHEN HANDLING THE LENTICULAR SCREEN AND THE FRESNEL LENS. THIS PREVENTS CUTS AND FINGER PRINTS. DO NOT PLACE THE FRESNEL LENS IN THE SUN. THIS MAY CAUSE FIRE AND HEAT RELATED INJURIES.

Note: Store the Lenticular Screen and Fresnel Lens in a cool dry place. High humidity causes deformation of the Lenticular Screen and Fresnel Lens.

A. VS-45501

1. Apply double coated tape (Part # LENS-TAPE) along the top front edge of the Fresnel Lens as shown in figure 4-2.
2. Place the Fresnel Lens on top of the Lenticular Screen and apply pressure at the top edge to bond them together as shown in figure 4-2.

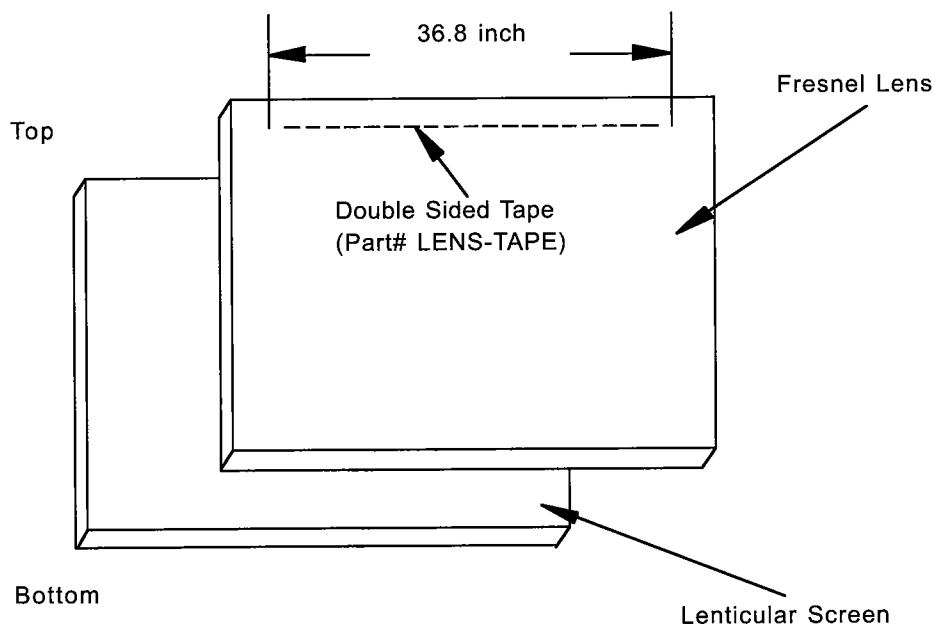


Figure 4-2

3. Installation of the Lenticular Screen and Fresnel Lens

CAUTION: WEAR GLOVES WHEN HANDLING THE LENTICULAR SCREEN AND THE FRESNEL LENS. THIS PREVENTS CUTS AND FINGER PRINTS.
DO NOT PLACE THE FRESNEL LENS IN THE SUN. THIS MAY CAUSE FIRE AND HEAT RELATED INJURIES.

Note: Store the Lenticular Screen and Fresnel Lens in a cool dry place. High humidity causes deformation of the Lenticular Screen and Fresnel Lens.

A. VS-50501

1. Apply double coated tape (Part # LENS-TAPE) along the top front edge of the Fresnel Lens as shown in figure 4-3.
2. Place the Fresnel Lens on top of the Lenticular Screen and apply pressure at the top edge to bond them together as shown in figure 4-3.

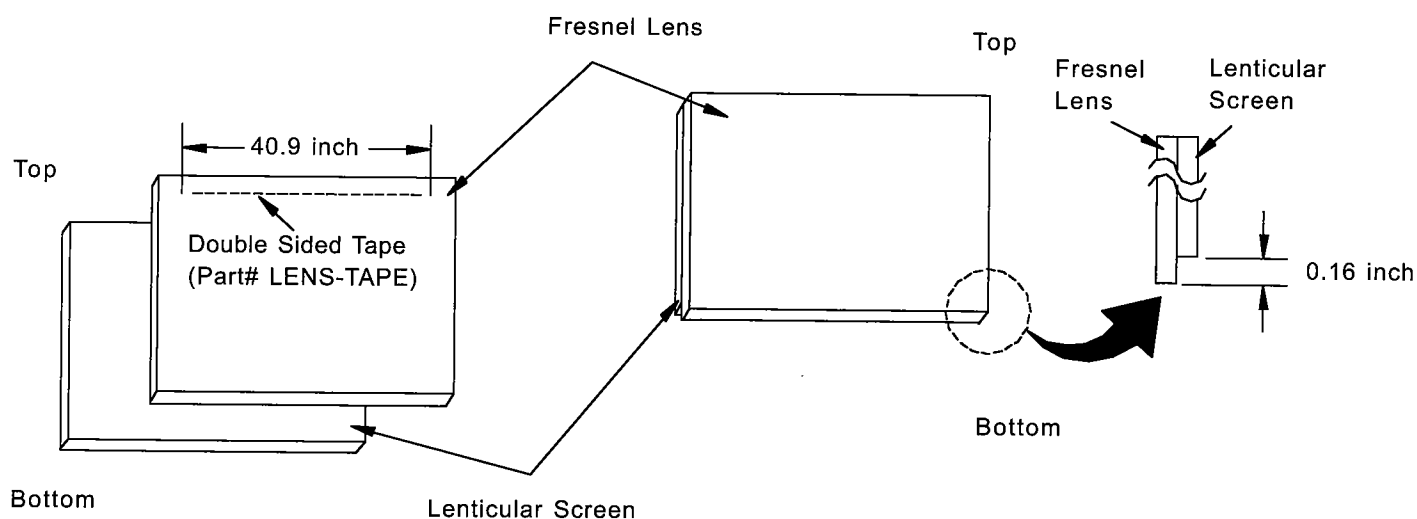


Fig. 4-3

CRT REPLACEMENT**1. Removal of the CRT**

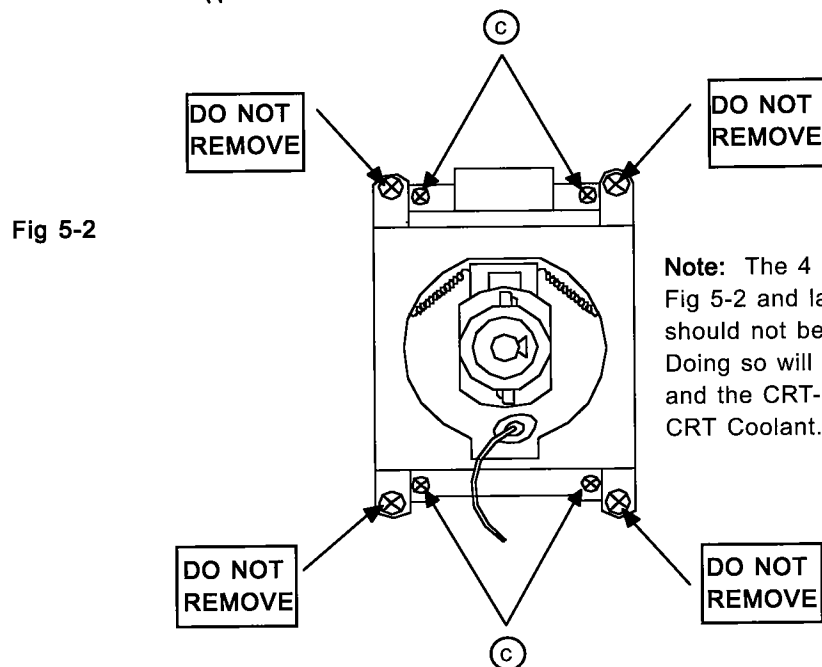
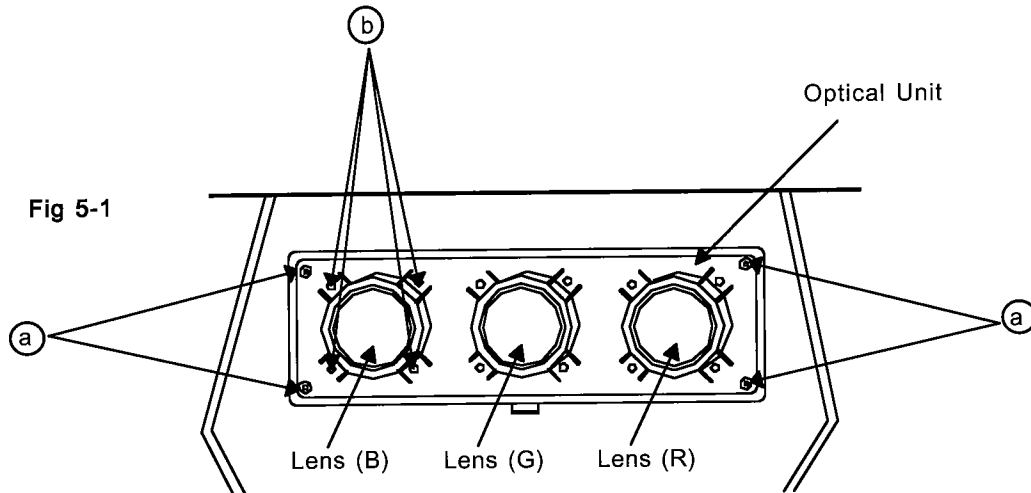
CAUTION! HIGH VOLTAGE SHOULD BE COMPLETELY DISCHARGED PRIOR TO ANODE CAP REMOVAL. SINCE ALL THREE CRTS RECEIVE HIGH VOLTAGE FROM THE FLYBACK TRANSFORMER, DISCHARGE EACH CRT BY SHORTING THE OPEN END OF EACH RESPECTIVE HIGH VOLTAGE CABLE TO CHASSIS GROUND.

Note: Refer to figures 2, and 2-1 when performing steps 1 through 4.

1. Remove the Speaker Grille.
2. Remove the Front Cover.
3. Remove the Screen Assy.
4. Remove the Back Board.
5. Remove the Anode Lead Wire from the Flyback Transformer.
6. Remove the PCB-CRT.
7. Remove 4 hex-screws "a" retaining the Optical Unit. [Fig. 5-1]
8. Remove 4 screws "b" retaining the Lens.

Note: DO NOT loosen the RED screws. Doing so will break the seal between the C-Element and the # 6 Lens, causing leakage of the CRT Coolant.

9. Remove 4 screws "c" retaining the CRT. [Fig. 5-2]
10. Remove the Deflection Yoke from the neck of the CRT. [Fig. 5-7]



INSTALLATION OF THE CRT

Note: The replacement CRT is supplied as an assembly comprised of the CRT and the Inner Lens with the space between them filled with ethylene glycol. Care should be taken during handling and installation to prevent shock from disrupting the seal or alignment between the CRT and Inner Lens. [Fig. 5-3]

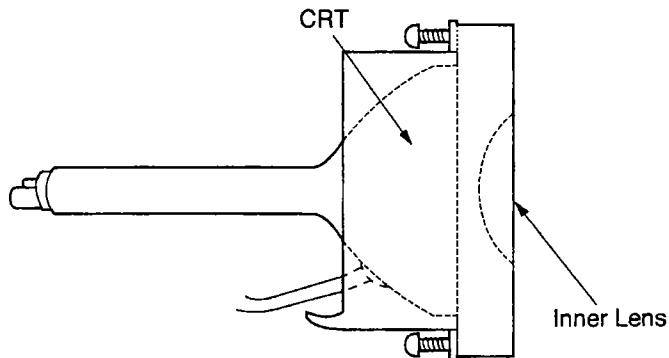


Fig 5-3

Note: The CRT fixing screws should not be loosened nor should they be removed. [Fig. 5-4]

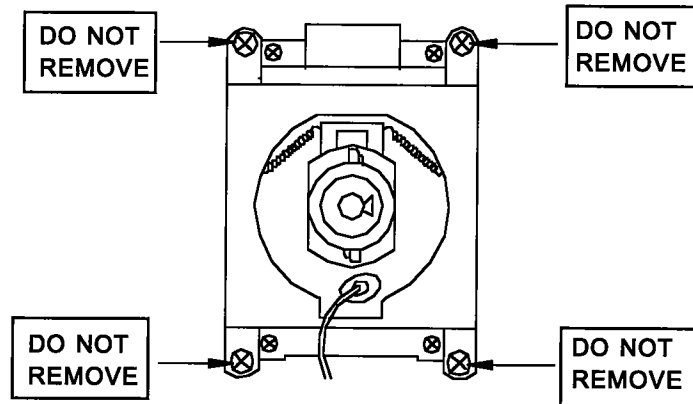


Fig 5-4

1. Carefully position the replacement CRT and fasten in place using 4 screws "d" shown in Fig. 5-6.

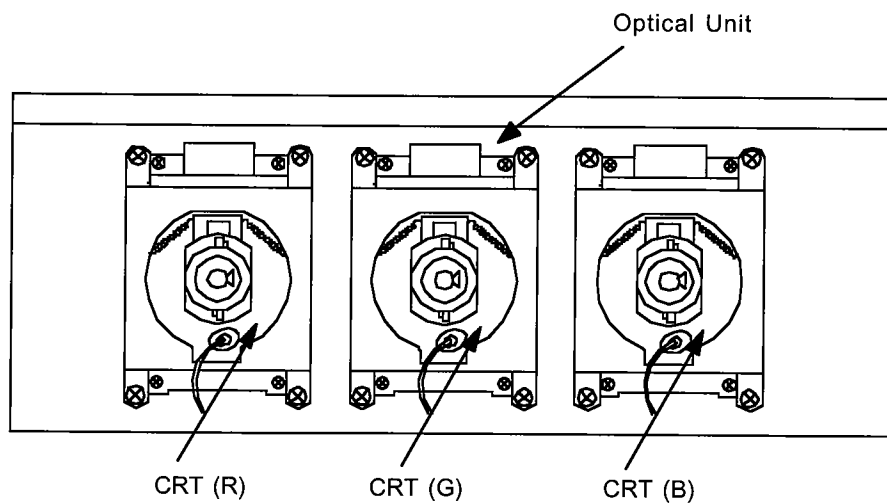


Fig 5-5

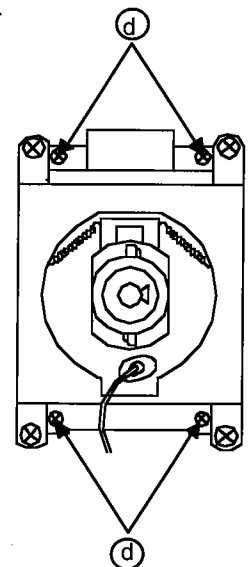


Fig 5-6

2. Install the Deflection Yoke on the CRT neck. [Fig. 5-7]
3. Install the Lens that was removed in steps 8 and 9 of Removal Of The CRT. [Figs. 5-1 and 5-2]
 - a) Position the Lens so that the Label faces the direction shown in Fig. 5-8.
 - b) Install the mounting screws. Refer to Fig. 5-1.
4. Install the PCB-CRT.
5. Insert the Optical Unit into the Light Box Assembly.
6. Insert the Anode Lead Wire into the Flyback Transformer.
7. Re-clamp the Lead Wire in its original position.

Note: Refer to Lead Dress Diagrams pages 46-47.

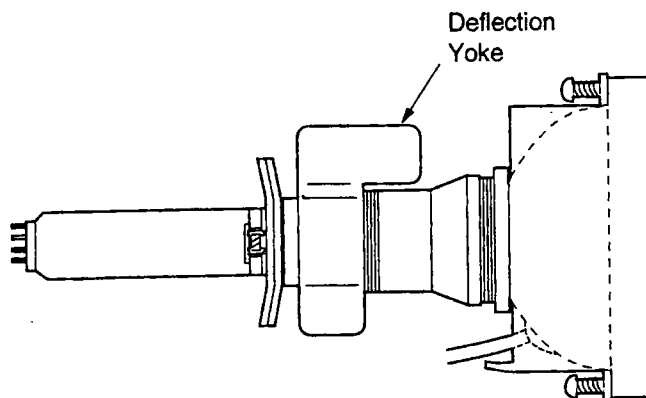


Fig 5-7

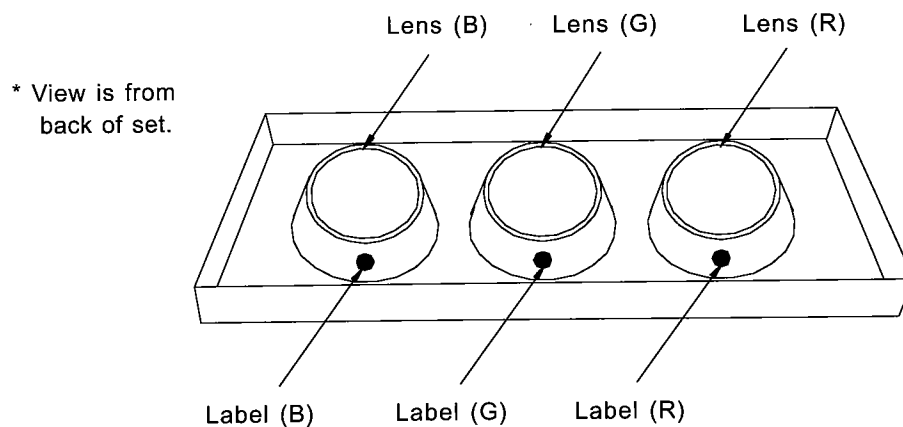


Fig 5-8

Adjustment procedures after replacing the CRT(s)

CRT Cut Off / White Balance Adjustment
 Static Convergence Adjustment
 Dynamic Convergence Adjustment

ELECTRICAL ADJUSTMENTS

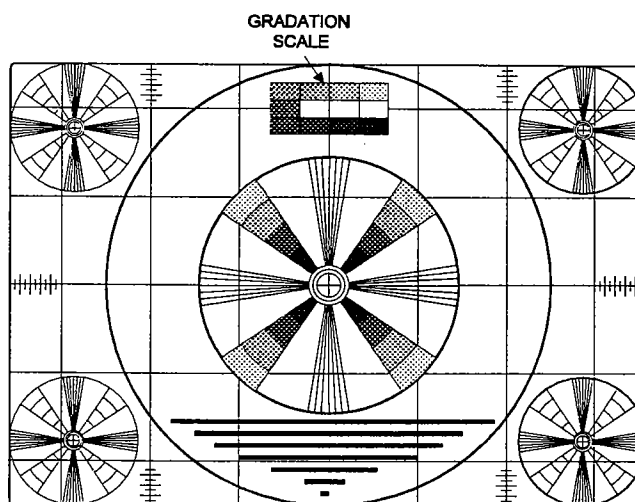
Note: Perform only the adjustments required.
Do not attempt an alignment if proper equipment is not available.

1. Measuring Equipment and Jigs

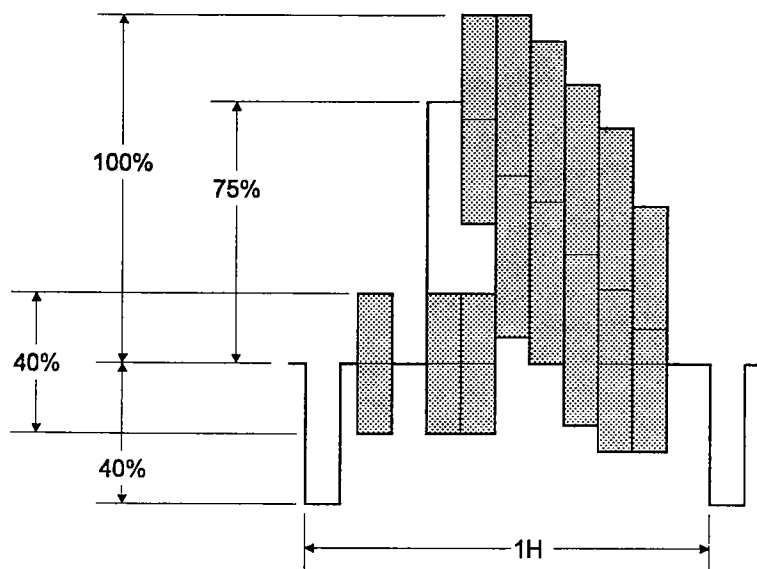
- * Oscilloscope (Unless otherwise specified, use 10:1 probes)
- * Signal Generator
- * Frequency Counter
- * Direct Current Voltmeter
- * Sweep Generator.
- * Direct Current Power Supply
- * Multiplex Audio Signal Generator
- * Direct Current Ampere Meter

2. Test Signal**A. Monoscope Signal**

Note: Connect the unit to a VCR and play an *alignment tape (Monoscope), if you do not have a monoscope signal source for adjustment.
(* Part Number: 859C568020)

**B. Color Bar Signal**

Use the color bar signal shown below, unless otherwise specified in this manual.

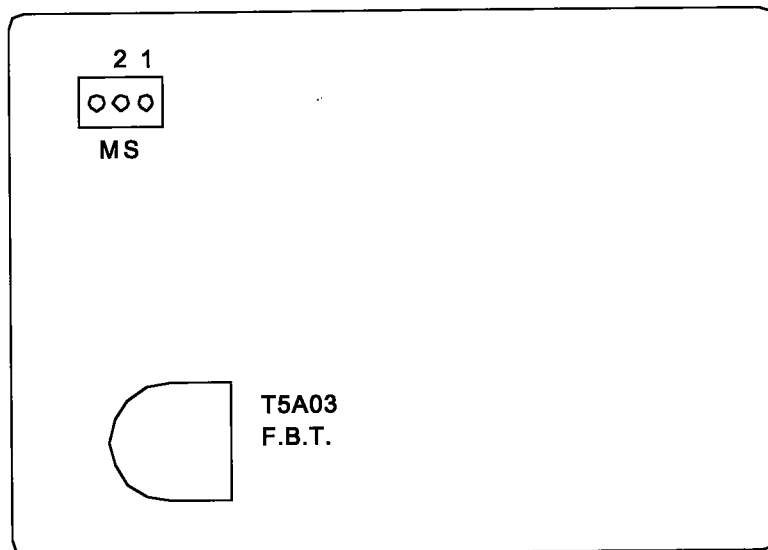


Split-Field Color Bars (100% window)

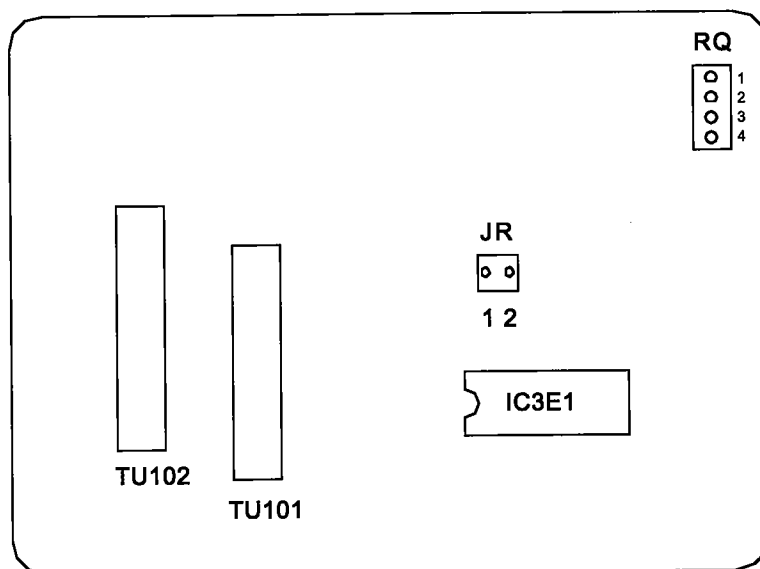
Monoscope Signal

3. Location of Test Points and Adjustments

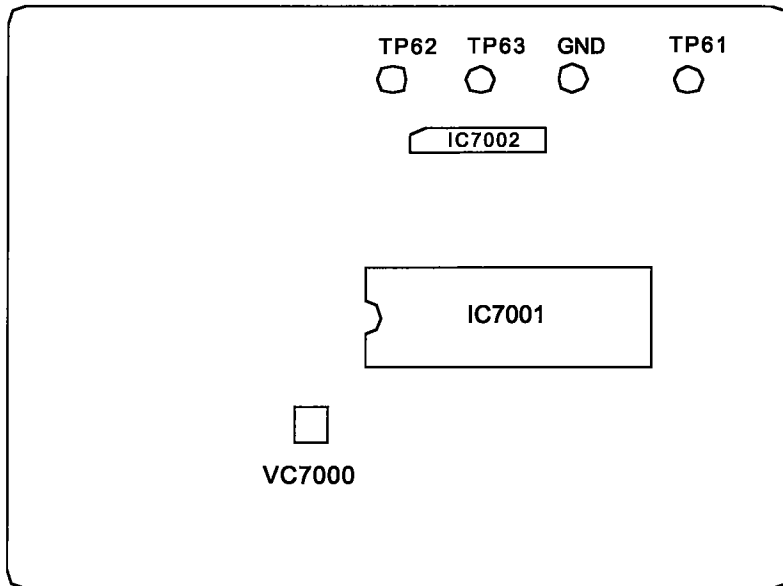
PCB-MAIN (COMPONENT SIDE)



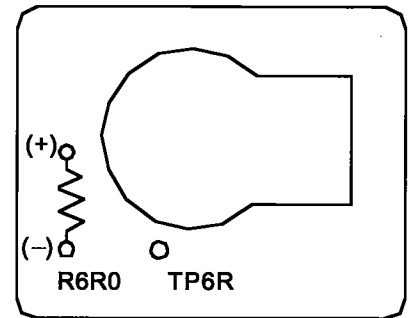
PCB-SIGNAL (COMPONENT SIDE)



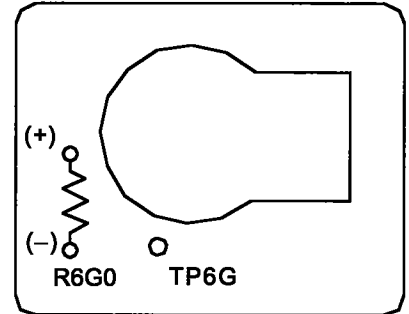
PCB-PIP/APT (COMPONENT SIDE)



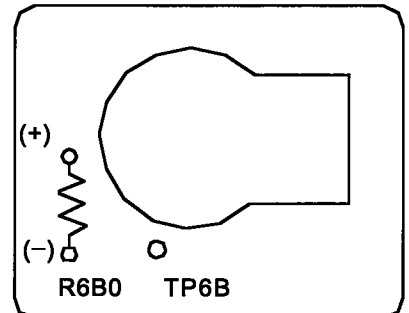
PCB-CRT (R)
(COMPONENT SIDE)



PCB-CRT (G)
(COMPONENT SIDE)



PCB-CRT (B)
(COMPONENT SIDE)



4. Option Menu Set Up

Follow the steps below for the Option Menu set up:

1. Set the receiver to the "TV" mode.
2. Select the "MENU" display by pressing the "MENU" button once.
3. Press the number buttons "2", "3", "5", "8" in sequence to select the "Option Menu" display.
4. Set the "Option Menu" as shown in the table below using the "ADJUST" and "ENTER" buttons.
5. Press the "MENU" button twice to return to normal viewing.

Option Menu

Initial	
Hotel	: OFF
Power Restore	: OFF
Antenna	: 2
Input	: 3
When Muting	: ON
Firmware Version Number	

Initial Settings

Initial Item	Initial Setting	Initial Item	Initial Setting
INPUT	TV	TV CC	When Muting
RECEIVING CH	CH 003	PIP SOURCE	TV
TV / CATV	CATV	PIP POSITION	Lower Right
Q.V.	CH 003	VIDEO MUTE	OFF
CHANNEL MEMORY	ALL CH (0.0)	NAME THE INPUT	ALL LABELS CLEAR
TV Lock	OFF	S.Q.V.	ALL CH CLEAR
Channel Lock	OFF	AUTO CLOCK	ON
LOCK CODE	----	A/V NETWORK	OFF
VOLUME	30%	SELECT LANGUAGE	English
AUDIO FUNCTIONS		NAME THE CHANNEL	ALL LABELS CLEAR
Listen To	STEREO	SELECT MENU TYPE	Standard Menu
Bass	50%	Parental Lock	Cancel
Treble	50%		
Balance	50%		
Surround	OFF		
Speaker	ON		
Monitor Out	Variable		
Level Sound	OFF		
VIDEO FUNCTIONS			
TV IRIS	OFF		
Tint	50%		
Color	50%		
Contrast	100%		
Brightness	50%		
Sharpness	50%		
Color Temp	High		
Background	Gray		
TV Instant Info	ON		

5. Service Menu Set Up

Follow the steps below for the initial set up:

1. Select the "MENU" display by pressing the "MENU" button once.
2. Press the number buttons "1", "3", "7", "0" in sequence to select the "SERVICE MENU" display.
3. Press the "ADJUST" button to select "Initial."
4. Press "ENTER."

NOTE: At this time channel 3 is automatically selected.

CAUTION: DO NOT ACTIVATE E2 RESET AS THIS WILL RESET ALL ALIGNMENT DATA.

Service Menu

Initial			
E2 RESET		3 Dia:	On
Hotel:	Off	Auto Clock:	On
Power Restore:	Off	Guide Plus:	Off
Antenna:	2		
Input:	3		
When Muting:	On		
Firmware Version Number			

5. Circuit Adjustment Mode

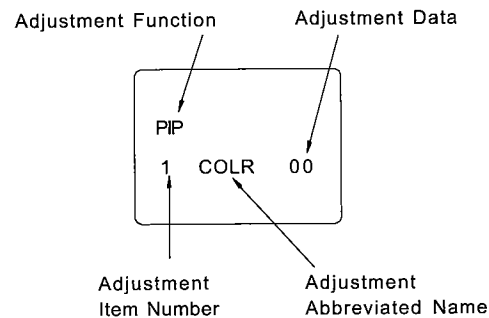
Except for the following, all adjustment items must be performed using the remote hand unit.

Adj. Item	Description
6	Lens Focus
7	Electrostatic Focus

A. Activating the Circuit Adjustment Mode

1. Press the "MENU" button on a remote hand unit.
(The "MENU" display will appear.)
2. Press the number buttons "2", "3", "5", "7" in sequence.
(The screen will change to the circuit adjustment mode.)

Note: Repeat steps 1 and 2 if circuit adjustment mode does not appear on screen.

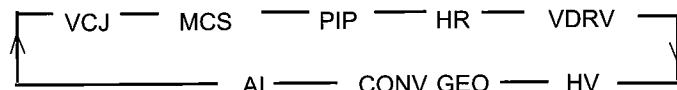


B. Selection of adjustment Functions and Adjustment Items

To select an adjustment item in the circuit adjustment mode, first select the adjustment function that includes the specific adjustment item to be selected. Then, select the adjustment item.

Refer to the following pages for the listing of adjustment functions and adjustment items.

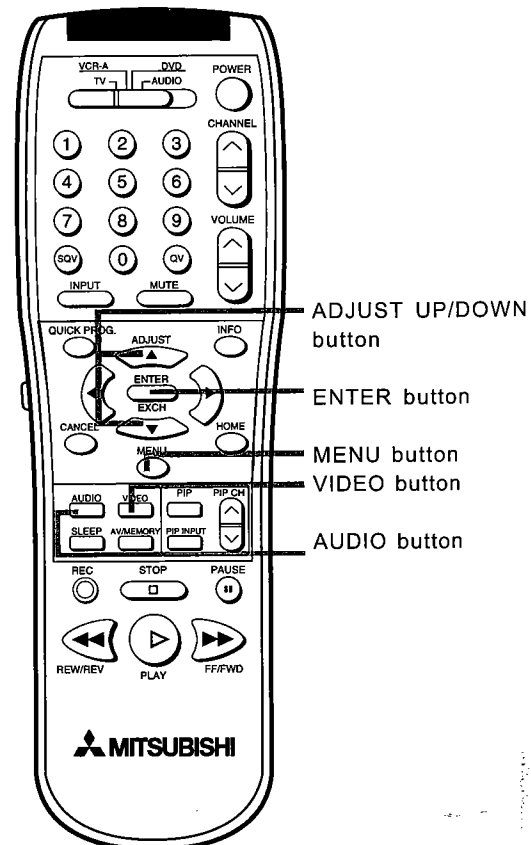
1. Press the "AUDIO" button on a remote hand unit to select an adjustment function. Each time the button is pressed, the adjustment function changes in the following sequence.



2. Press the "VIDEO" button to select a specific adjustment item. The adjustment item number increases each time the "VIDEO" button is pressed.

C. Changing data

After selecting an adjustment item, use the 'ADJUST' button to change the adjustment data.



D. Saving Adjustment Data

Press "ENTER" to save the adjustment data in memory. The character display turns red for approximately one second in this step.

Note: If the circuit adjustment mode is terminated without pressing the "ENTER" button, changes in adjustment data are not saved (with the exception of PIP adjustments).

E. Terminating the Circuit Adjustment Mode

Press the "MENU" button on the remote hand unit twice to terminate the circuit adjustment mode.

Note: The circuit adjustment mode can also be terminated by turning the power off.

When Replacing the EEPROM (IC701)

The EEPROM (IC701) stores the adjustment data. After replacing the EEPROM, readjust the data to the values given in the following tables. If good performance is not obtained with these values, perform the Adjustment Procedure(s) given in the Note column.

List of Adjustment Items

Function Display		VCJ				IC200
Item Number	Abbreviated Name	Adjustment Name	Range	Initial Data	Note	
0	CON	PICTURE GAIN CONTROL	0~63	42	#4 (CRT Cut Off, White Balance)	
1	TNT	TINT CONTROL 1	0~63	31		
2	COL	COLOR GAIN CONTROL 1	0~63	31		
3	BRT	BRIGHT LEVEL CONTROL 1	0~63	31		
4	SHP	SHARPNESS GAIN CONTROL	0~15	6		
5	CTG	G CUT-OFF ADJ.	0~15	7		
6	CTB	B CUT-OFF ADJ.	0~15	7		
7	DRG	G DRIVE GAIN ADJ.	0~63	42		
8	DRB	B DRIVE GAIN ADJ.	0~63	42		
9	LDG	LOW GREEN DRIVE GAIN	0~63	20		
10	LDB	LOW BLUE DRIVE GAIN	0~63	20	#4 (CRT Cut Off, White Balance)	
11	YDL	Y CHROMA TRAP	0~1	0	#10 (Black Level)	
12	VM	Y OUTPUT FOR VM	0~1	0		
13	DCT	SW OF DC PROPAGATED RATE	0~1	1		
14	DPC	SW OF BLK LEVEL EXPANSION	0~1	1		
15	TOT	SW OF CHROMA TOT FILTER	0~1	0		
16	AXS	SW OF R-Y, G-Y AXIS	0~1	1		
17	DCO	SW OF DYNAMIC COLOR	0~1	1		
18	ABL	SW OF ABL MODE	0~1	0		
19	DL1	RATIO OF PRE/OVER-SHOOT	0~3	0		
20	DL2	SHARPNESS F0 CONTROL	0~3	1		
21	SCN	CONTRAST GAIN CONTROL	0~15	3	#9 (Vertical Linearity)	
22	CTA	CHROMA TRAP F0 ADJ.	0~15	7		
23	SCL	COLOR GAIN CONTROL	0~15	2		
24	SHU	TINT CONTROL	0~15	10		
25	SBR	BRIGHT LEVEL CONTROL	0~63	31		
26	GMG	GAMMA CONTROL	0~3	2		
27	AG1	AGING MODE - WHITE OUTPUT	0~1	0		
28	AG2	AGING MODE - BLACK OUTPUT	0~1	0		
29	RON	R VIDEO OUTPUT	0~1	1		
30	GON	G VIDEO OUTPUT	0~1	1		
31	BON	B VIDEO OUTPUT	0~1	1	#7 (Sub Contrast)	
32	PON	RGB VIDEO OUTPUT	0~1	1		
33	VOF	SW OF V-SAW OSCILLATION	0~1	1		
35	CMD	SW OF V COUNTDOWN	0~1	0		
37	VHT	VERTICAL HEIGHT	0~63	21		
40	AFC	AFC LOOP GAIN	0~3	1		
41	VSC	ADJ OF VERT S-CORRECTION	0~15	7		
42	VLR	VERT LINEARITY ADJ.	0~15	7		
44	RPO	REFERENCE PULSE TIMING	0~3	3		
47	HPS	HORIZ POSITION ADJ.	0~15	5		
51	ABW	VERT BOW CORRECTION	0~15	7		
52	AAG	VERT TILT CORRECTION	0~15	7		
55	HBL	H BLK ON SOFT-FULL MODE	0~1	1	#7 (Sub Contrast)	
61	LBK	H BLK OF LEFT SIDE	0~15	9		
62	RBK	H BLK OF RIGHT SIDE	0~15	12		
69	SCT	PICTURE CONTROL	0~63	42		
70	ESY	*FACTORY SET-UP ONLY*	0~1	0		
71	CD2	*FACTORY SET-UP ONLY*	0~1	0		

Function Display		PIP IC7001			
Item Number	Abbreviated Name	Adjustment Name	Range	Initial Data	Note
0	CONT	CONTRAST	0~127	48	#18 (PIP Contrast) #16 (PIP Chroma Gain) #17 (PIP Sub Tint)
1	COLR	COLOR OUTPUT GAIN	0~127	34	
2	TINT	TINT	0~63	28	
3	BRIT	BRIGHTNESS	0~31	15	
4	EMPH	EMPHASIS	0~1	1	
5	DECD	DECODE	0~1	0	
6	SYNC	SYNC LEVEL	0~3	3	
7	RVS	GREY BACKGROUND	0~1	0	
8	RVHS	FREE RUN CONTROL	0~1	0	
9	BG-Y	BACKGROUND LUMINANCE	0~16	12	
10	BSTB	BURST GAIN BLUE	0~255	76	
11	BSTR	BURST GAIN RED	0~255	145	
12	MVW	MACROVISION	0~255	0	
13	CRTN	FIXED DATA	0~3	3	
14	VXA	VERTICAL POSITION	0~255	145	
15	VXS	VERTICAL SAMPLING POSITION	0~63	41	
16	HXA0	HORIZONTAL POSITION	0~255	97	
17	ADJ	HORIZONTAL DELAY	0~3	4	
18	YDL	SUB Y DELAY	0~255	4	
19	HPX	SAMPLING STARTING POSITION	0~63	3	
20	VYA9	SUB VERTICAL WIDTH (1/9)	0~255	68	
21	HYA9	SUB HORIZONTAL WIDTH (1/9)	0~63	56	
22	VYA6	SUB VERTICAL WIDTH (1/6)	0~255	51	
23	HYA6	SUB HORIZONTAL WIDTH (1/6)	0~63	42	
24	BGBY	B-Y GAIN	0~7	4	
25	BGRY	R-Y GAIN	0~7	4	
26	CHRO	CHROMA ALIGNMENT	0~63	63	
27	EXTP	EXTENSION PORT	0~3	2	
28	BGPM	BURST GATE PULSE	0~1	1	
29	HX	SAMPLING START POSITION	0~63	22	
30	EXSY	ANALOG SYNC SEPARATOR	0~3	2	
31	LPF	LOW PASS FILTER	0~3	2	
32	BHS9	EXT/INT SYNC (1/9)	0~3	3	
33	BHS6	EXT/INT SYNC (1/6)	0~3	3	
34	HADJ	BGP POSITION	0~16	15	
35	BGST	BGP PHASE SETTING	0~63	14	
36	EXHD	EXT HD	0~3	0	
37	EXVD	EXT VD	0~1	0	
38	PN28	PIN 28 OUTPUT	0~63	1	
39	BGPX	BURST GATE PULSE OUTPUT ALIGNMENT	0~63	29	
40	BGPY	COLOR SATURATION ALIGNMENT	0~63	63	
41	BPF1	BANDPASS FILTER	0~3	0	
42	TACC	TEST ACC LEVEL	0~63	0	
43	ACC	ACC LEVEL	0~63	21	
44	FSC	*FACTORY ADJUSTMENT ONLY*	0~3	0	

Function Display		HR			
Adjustment Name			Range	Data	Note
Character Position			0~25	20	#12 CHR POS.

Function Display		MCS				IC3E1
Item Number	Abbreviated Name	Adjustment Name	Range	Initial Data	Note	
0	INP	INPUT LEVEL ADJ	0~15	7	#1 (Input Level)	
1	AUT	STEREO ADJ	0~1	0		
2	WDE	SPECTRAL WIDE	0~31	16		
3	SPC	SPECTRAL EXPANSION	0~31	16		
4	ATK	ATTACK TIME FOR AVL	0~3	1	#1 (Input Level)	
5	VZX	ZERO CROSS VOLUME	0~1	1	#1 (Input Level)	
6	MZX	ZERO CROSS MUTE	0~1	1	#1 (Input Level)	

Function Display		VDRV				IC870
Item Number	Abbreviated Name	Adjustment Name	Range	Initial Data	Note	
0	PCON	CONVERGENCE PHASE	0~255	128		
1	PFOC	FOCUS PHASE	0~255	0	DISPLAY ONLY	
2	WCON	CONVERGENCE PULSE WIDTH	0~63	33		
3	WFOC	FOCUS PULSE WIDTH	0~63	44	DISPLAY ONLY	
4	PLL	PLL DIVIDING RATIO	0~15	5	#14 (Dynamic Convergence)	

Function Display		HV				IC8D00
Item Number	Abbreviated Name	Adjustment Name	Range	Initial Data	Note	
0	HV	HIGH VOLTAGE CONTROL	0~254	150	#3 (HV Control)	

Function Display		AI				
Item Number	Abbreviated Name	Adjustment Name	Range	Initial Data	Note	
0	OT1	*AUTO IRIS* FACTORY ADJUSTMENT ONLY	0~255	60		
1	IT2		0~255	140		
2	CN0		0~63	02		
3	CN1		0~63	07		
4	CN2		0~63	63		
5	BR0		0~63	28		
6	BR1		0~63	30		
7	BR2		0~63	31		

Function Display		CONV GEO				IC8G00
Item Number	Abbreviated Name	Adjustment Name	Range	Data	Note	
0	HWID	HORIZ WIDTH	0~254	127	#10 (Horizontal Width)	
1	TILT	TILT	0~254	127	#11 (Raster Correction)	
2	VBOW	VERT BOW	0~254	127	#11 (Raster Correction)	
3	SKEW	SKEW	0~254	127	#11 (Raster Correction)	
4	HBOW	HORIZ BOW	0~254	127	#11 (Raster Correction)	
5	TBPC	TOP/BOTTOM PIN CUSHION	0~254	127	#11 (Raster Correction)	
6	EWPC	EAST/WEST PIN CUSHION	0~254	127	#11 (Raster Correction)	
7	VIPC	VERT INSIDE PIN CUSHION	0~254	127	#11 (Raster Correction)	
8	HIPC	HORIZ INSIDE PIN CUSHION	0~254	127	#11 (Raster Correction)	
9	HKEY	HORIZ KEYSTONE	0~254	127	#11 (Raster Correction)	
10	VKEY	VERT KEYSTONE	0~254	127	#11 (Raster Correction)	
11	VSBW	VERT SIDE BOW	0~254	127	#11 (Raster Correction)	
12	VSTL	VERT SIDE TILT	0~254	127	#11 (Raster Correction)	
13	V3RD	VERT 3RD CORRECTION	0~254	127	#11 (Raster Correction)	
14	V4TH	VERT 4TH CORRECTION	0~254	127	#11 (Raster Correction)	
15	HSBW	HORIZ SIDE BOW	0~254	127	#11 (Raster Correction)	
16	HSKW	HORIZ SIDE SKEW	0~254	127	#11 (Raster Correction)	
17	H3RD	HORIZ 3RD CORRECTION	0~254	127	#11 (Raster Correction)	
18	HSSS	HORIZ SIDE S CORRECTION	0~254	127	#11 (Raster Correction)	
19	HLIN	HORIZ LINEARITY	0~254	127	#11 (Raster Correction)	
20	HSLN	HORIZ SIDE LINEARITY	0~254	127	#11 (Raster Correction)	

Function Display		CONV				Red: IC8D00 Blue: IC8E00
Item Number	Abbreviated Name	Adjustment Name	Range	Data	Note	
Red	Blue					
0	30	HSTA	HORIZ STATIC	0~254	127	#14 (Dynamic Convergence)
1	31	VSTA	VERT STATIC	0~254	127	#14 (Dynamic Convergence)
2	32	TILT	VERT TILT	0~254	127	#14 (Dynamic Convergence)
3	33	BOW	VERT BOW	0~254	127	#14 (Dynamic Convergence)
4	34	SKEW	SKEW	0~254	127	#14 (Dynamic Convergence)
5	35	HBOW	HORIZ BOW	0~254	127	#14 (Dynamic Convergence)
6	36	VWID	VERT HEIGHT	0~254	127	#14 (Dynamic Convergence)
7	37	VLIN	VERT LINEARITY	0~254	127	#14 (Dynamic Convergence)
8	38	HWID	HORIZ WIDTH	0~254	127	#14 (Dynamic Convergence)
9	39	HLIN	HORIZ LINEARITY	0~254	127	#14 (Dynamic Convergence)
10	40	HSDL	LEFT HORIZ SIDE	0~254	127	#14 (Dynamic Convergence)
11	41	HSDR	RIGHT HORIZ SIDE	0~254	127	#14 (Dynamic Convergence)
12	42	SLIN	HORIZ LIN MIDDLE (1)	0~254	127	#14 (Dynamic Convergence)
13	43	CLIN	HORIZ LIN MIDDLE (2)	0~254	127	#14 (Dynamic Convergence)
14	44	VKLU	VERT KEYSTONE (L-UPPER)	0~254	127	#14 (Dynamic Convergence)
15	45	HKLU	HORIZ KEYSTONE (L-UPPER)	0~254	127	#14 (Dynamic Convergence)
16	46	VKLL	VERT KEYSTONE (L-LOWER)	0~254	127	#14 (Dynamic Convergence)
17	47	HKLL	HORIZ KEYSTONE (L-LOWER)	0~254	127	#14 (Dynamic Convergence)
18	48	VKRL	VERT KEYSTONE (R-LOWER)	0~254	127	#14 (Dynamic Convergence)
19	49	HKRL	HORIZ KEYSTONE (R-LOWER)	0~254	127	#14 (Dynamic Convergence)
20	50	VKRU	VERT KEYSTONE (R-UPPER)	0~254	127	#14 (Dynamic Convergence)
21	51	HKRU	HORIZ KEYSTONE (R-UPPER)	0~254	127	#14 (Dynamic Convergence)
22	52	LHBW	HORIZ SLOPING ENDS (LEFT)	0~254	127	#14 (Dynamic Convergence)
23	53	RHBW	HORIZ SLOPING ENDS (RIGHT)	0~254	127	#14 (Dynamic Convergence)
24	54	LVBW	VERT SLOPING ENDS (LEFT)	0~254	127	#14 (Dynamic Convergence)
25	55	RVBW	VERT SLOPING ENDS (RIGHT)	0~254	127	#14 (Dynamic Convergence)
-	56	DA42	KEYSTONE OFFSET	0~254	127	#14 (Dynamic Convergence)
27	57	DA50	----	0~254	127	Display Only
28	58	DA51	----	0~254	127	Display Only
29	59	DA52	----	0~254	127	Display Only

[MULTI CHANNEL SOUND CIRCUIT]

1. Input Level

Adjustment purpose

Set the level of the input signal for the multi channel sound circuit.

Symptom when

incorrectly adjusted

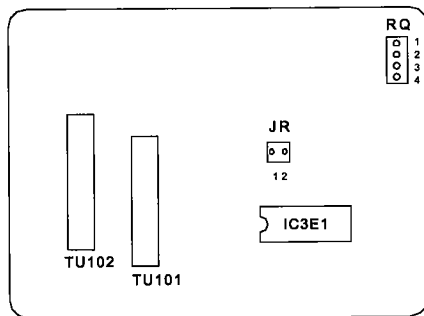
Distorted sound during an MCS broadcast.

Measuring Instrument	Oscilloscope
Test Point	Connector "JR" pin 2
Exit Trigger	-----
Measurement range	DIV 50mV TIME 2ms
Input Signal	RF signal (Monaural Sound)
Input Terminal	RF IN terminal

1. Supply an RF signal (monaural sound 400Hz 100% MOD).
 2. Connect the oscilloscope to connector "JR" pin 2.
 3. Press the "MENU" button on a remote hand unit.
 4. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode.
 5. Set the adjustment function to "MCS" by pressing the "AUDIO" button.
 6. Initialize adjustment values to those shown in the table below by pressing the "VIDEO" and "ADJUST" buttons.
 7. Select adjustment item "0 INP" using the "VIDEO" button.
 8. Set the adjustment data so that the amplitude is 500 ± 20 mVrms (1.41 ± 0.05 Vp-p)
 9. Press "ENTER" to write the adjustment data into memory.
 10. Press the "MENU" button twice to terminate the circuit adjustment mode.
- Note:** Adjustment item 2 (Stereo Separation) must be performed after this adjustment.

Adjustment Abbreviated Name	Initial Data
0 INP	7
1 AUT	0
2 WDE	16
3 SPC	16
4 ATTK	1
5 VZX	1
6 MZX	1

PCB-SIGNAL (COMPONENT SIDE)



[MULTI CHANNEL SOUND CIRCUIT]

2. Separation

Adjustment purpose

Adjust right and left separation.

Symptom when

incorrectly adjusted

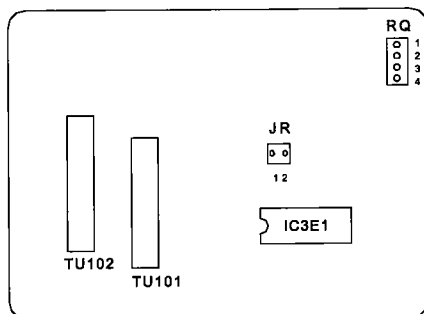
Poor or no stereo separation.

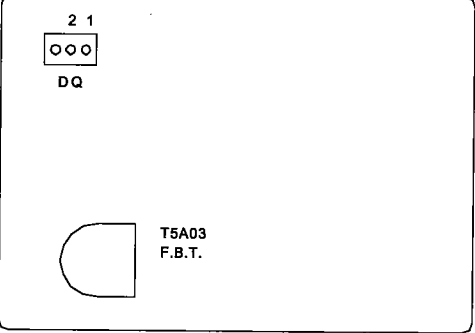
Measuring Instrument	Oscilloscope
Test Point	Connector "JR" pin 2
Exit Trigger	-----
Measurement range	Division 10mV Time 2ms
Input Signal	RF signal (Stereo Sound)
Input Terminal	RF IN terminal

Note: This adjustment must follow item 1 (Input Level)

1. Supply an RF signal (L-CH stereo sound 300Hz 30% MOD).
2. Connect the oscilloscope to connector "JR" pin 2.
3. Press the "MENU" button on a remote hand unit.
4. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode.
5. Set the adjustment function to "MCS" by pressing the "AUDIO" button.
6. Make sure that the value of item "3 SPC" is 16.
7. Select adjustment item "2 WDE" using the "VIDEO" button
8. Using the "ADJUST" button, set the adjustment data so that the amplitude of the 300Hz waveform is at minimum.
9. Change the modulation frequency to 3kHz.
10. Select adjustment item "3 SPC" using the "VIDEO" button.
11. Using the "ADJUST" button, set the adjustment data so that the amplitude of the 3kHz waveform is at minimum.
12. Repeat steps 7 and 8.
13. Press "ENTER" to write the adjustment data into memory.
14. Press the "MENU" button twice to terminate the circuit adjustment mode.

PCB-SIGNAL (COMPONENT SIDE)



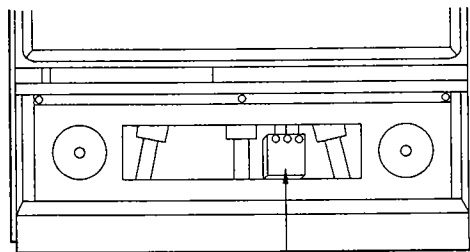
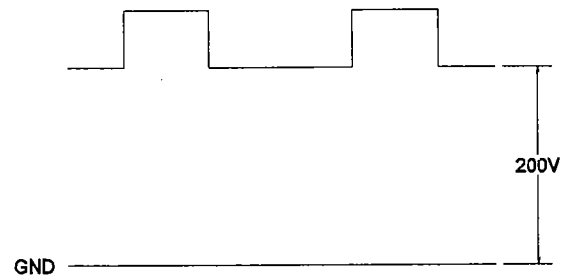
[High Voltage Circuit]		Adjustment purpose	CRT anode voltage.
3. High Voltage Control		Symptom when incorrectly adjusted	Too dark picture.
Measuring Instrument	DC Voltmeter	Note: <i>This adjustment must follow item 4 (CRT Cut OFF, White Balance). Set the CONTRAST control to maximum and BRIGHTNESS control to center position..</i> 1. Supply a VIDEO signal (monoscope). 2. Observe the DC voltage between pins 1 and 2 of connector DQ. (positive lead to pin 2). 3. Press the "MENU" button on a remote hand unit. 4. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode. 5. Set the adjustment function to "HV" by pressing the "AUDIO" button. 6. Select the adjustment item "0 HV" using the "VIDEO" button. 7. Set the adjustment data so the DC voltmeter reads $0.15 \pm 0.005V$ using the "ADJUST" button. 8. Press "ENTER" to write the adjustment data into memory. 9. Press the "MENU" button twice to terminate the circuit adjustment mode. 10. Confirm the voltage at DQ pin 2 does not exceed 0.85V. 11. If voltage exceeds this limit, repeat adjustment procedure.	
Test Point	- Lead: pin 1 of connector DQ + Lead: pin 2 of connector DQ		
Exit Trigger	----		
Measurement range	----		
Input Signal	VIDEO signal (Monoscope)		
Input Terminal	VIDEO IN terminal		
PCB-MAIN (COMPONENT SIDE) 			

[CRT Circuit] 4. CRT Cut Off, White Balance	Adjustment purpose To set the cut off point of the three CRTs Symptom when incorrectly adjusted Monochrome with color tint, or incorrect brightness.
--	---

Measuring Instrument	DC Ammeter Oscilloscope
Test Point	TP6R/G/B
Exit Trigger	-----
Measurement Range	Division 5V Time 2ms
Input Signal	----
Input Terminal	

1. Select the EXT-1 input with no signal supplied.
2. Press the "MENU" button on a remote hand unit.
3. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode.
4. Set the adjustment function "VCJ " by pressing the "AUDIO" button.
5. Set the items shown in the Table to the given data values.
6. Observe the waveform at TP6R.
7. Adjust the SCREEN control (R) so that the voltage is 200V.
8. Observe the waveform at TP6G.
9. Adjust the SCREEN control (G) so that the voltage is 200V.
10. Observe the waveform at TP6B.
11. Adjust the SCREEN control (B) so that the voltage is 200V.

Abbreviated Name	Data
3 BRT	31
5 CTG	7
6 CTB	7
7 DRG	42
8 DRB	42
25 SBR	31

Focus Pack
(SCREEN VR)

FRONT VIEW

12. Supply a VIDEO signal (full white raster)
13. Set adjustment data of "7 DRG" and "8 DRB" so that the white level is optimum at the center of the screen.
14. Observe the waveform at "TP6G".
15. Set the data of "5 CTG" so that the voltage is 200V.
16. Observe the waveform at "TP6B".
17. Set the data of "6 CTB" so the the voltage is 200V.
18. Measure the DC current as indicated in Table 1.

Note: The internal resistance of the ammeter must be 30 Ω or less, and the length of the lead wires should be 12 inches or less. Measure the current in the three CRTs at the same time. Make sure that the current in the GREEN and BLUE CRTs does not exceed the values shown in Table 2. If excessive, readjust the current to the approximate values given in Table 3 and repeat steps 1-18.

19. Press "ENTER" to write the adjustment data into memory.
20. Press the "MENU" button twice to terminate the circuit adjustment mode.

	Connections of Ampere Meter	
	Positive	Negative
R	R6R0 (+ SIDE)	R6R0 (- SIDE)
G	R6G0 (+ SIDE)	R6G0 (- SIDE)
B	R6B0 (+SIDE)	R6B0 (- SIDE)

Table 1

	Maximum Current
G	580 μ A
B	530 μ A

Table 2

Current Proportion		
R	G	B
225 μ A	540 μ A	485 μ A

Table 3

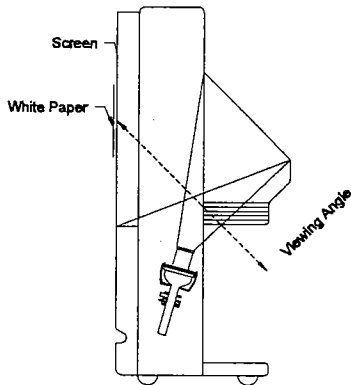
[Focus Circuit]**5. Lens Focus****Adjustment purpose** The best resolution of the picture.**Symptom when incorrectly adjusted** Blurred picture.

Measuring Instrument	-----
Test Point	-----
Exit Trigger	-----
Measurement range	-----
Input Signal	VIDEO signal (Monoscope)
Input Terminal	VIDEO IN terminal

Note: This adjustment must follow item 6 (Electrostatic Focus). Perform this adjustment for RED, GREEN, and BLUE monochrome pictures.

1. Supply a VIDEO signal (monoscope).
2. Produce a GREEN monochrome picture.
 - a) Press the "MENU" button on a remote hand unit.
 - b) Press the buttons 2-3-5-9 then press the button specified in the table below to select each color.
3. Adjust the position of the lens for the best picture resolution.

NOTE: Attach a white paper to the inside center of the screen. During adjustment, observe the picture on the screen from inside for easier adjustment.
4. Display the original picture and press "MENU" twice.

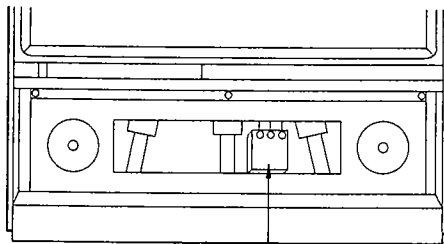


Monochrome Picture	Remote Hand Unit Button
RED	1
GREEN	2
BLUE	3

[Focus Circuit]**6. Electrostatic Focus****Adjustment purpose** For best resolution of the picture.**Symptom when incorrectly adjusted** Out of focus picture.

Measuring Instrument	-----
Test Point	-----
Exit Trigger	-----
Measurement range	-----
Input Signal	VIDEO signal (Monoscope)
Input Terminal	VIDEO IN terminal

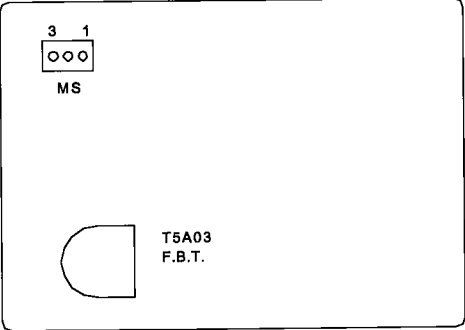
- Note:** This adjustment must follow item 7 (Sub Contrast). If you replace the CRT, this adjustment must follow item 5, (Lens Focus). Perform this adjustment respectively for RED, GREEN, and BLUE monochrome pictures.
1. Supply a VIDEO signal (monoscope).
 2. Press the "A/V RESET" button in the control panel to reset all VIDEO FUNCTIONS.
 3. Produce a monochrome picture.
 - a) Press the "MENU" button on a remote hand unit.
 - b) Press the buttons 2-3-5-9 then press the button specified in the table below to select each color.
 4. Adjust the FOCUS VR on the focus pack so the sharpness of the upper area of the screen is optimum.
 5. Display the original picture and press "MENU" twice.

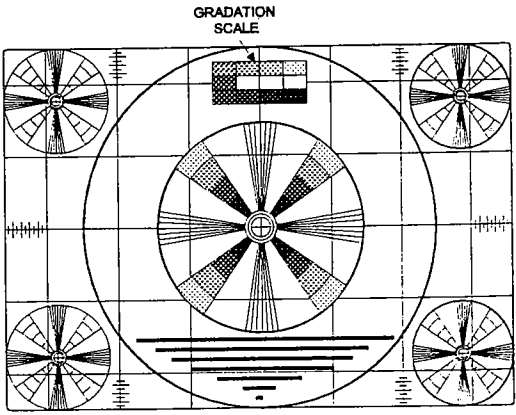


Focus Pack
(SCREEN VR)

FRONT VIEW

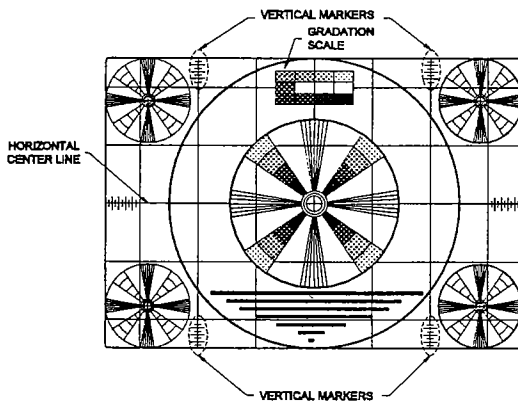
Monochrome Picture	Remote Hand Unit Button
RED	1
GREEN	2
BLUE	3

[Video Circuit]		Adjustment purpose To set the beam current to its optimum value. Symptom when incorrectly adjusted Excessive or insufficient contrast.
7. Sub Contrast		
Measuring Instrument	DC Milliammeter	Note: This adjustment must follow item 4 (CRT Cut-Off, White Balance). Preheat the set for two minutes or more. 1. Supply an RF signal (gray scale 87.5% MOD). 2. Press the "MENU" button on a remote hand unit. 3. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode. 4. Set the adjustment function "VCJ " by pressing the "AUDIO" button. 5. Select the adjustment item "69 SCT" using the "VIDEO" button. 6. Measure the current at pins 1 and 3 of connector MS (Plus lead to pin 3). 7. Set the adjustment data so the DC milliammeter reads $725 \pm 25\mu A$. 8. Press "ENTER" to write the adjustment data into memory. 9. Press the "MENU" button twice to terminate the circuit adjustment mode.
Test Point	+ Lead: pin 3 of connector MS - Lead: pin 1 of connector MS	
Exit Trigger	----	
Measurement range	3mA	
Input Signal	RF signal (Gray scale 87.5% MOD)	
Input Terminal	RF IN terminal	
PCB-MAIN (COMPONENT SIDE) 		

[Video Circuit]		Adjustment purpose Picture Luminance. Symptom when incorrectly adjusted Excessive or insufficient brightness.												
8. Black Level														
Measuring Instrument	----	Note: This adjustment must follow item 7 (Sub-Contrast). 1. Supply an VIDEO signal (monoscope). 2. Press the "MENU" button on a remote hand unit. 3. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode. 4. Set the adjustment function "VCJ " by pressing the "AUDIO" button. 5. Select the adjustment item "25 SBR" using the "VIDEO" button. 6. Observe the gradation pattern inside a monoscope signal, and set the adjustment data so that both levels, at the 10% and 0% areas of the gradation pattern, are the same (black level 8%) using the "ADJUST" button. 7. Press "ENTER" to write the adjustment data into memory. 8. Press the "MENU" button twice to terminate the circuit adjustment mode.												
Test Point	----													
Exit Trigger	----													
Measurement range	----													
Input Signal	VIDEO signal (Monoscope)													
Input Terminal	VIDEO IN terminal													
<table style="margin: auto;"> <tr> <td>40%</td> <td>30%</td> <td>20%</td> <td>10%</td> </tr> <tr> <td>50%</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> </tr> </table> GRADATION SCALE		40%	30%	20%	10%	50%	0%	0%	0%	60%	70%	80%	90%	
40%	30%	20%	10%											
50%	0%	0%	0%											
60%	70%	80%	90%											

[Deflection Circuit]**Adjustment purpose** To set vertical linearity.**9. Vertical Linearity, Height and S-Correction****Symptom when incorrectly adjusted** Incorrect vertical height and linearity.

Measuring Instrument	-----
Test Point	-----
Exit Trigger	-----
Measurement range	-----
Input Signal	VIDEO signal (Monoscope)
Input Terminal	VIDEO IN terminal



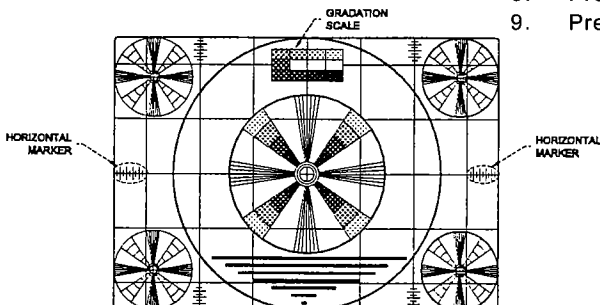
1. Supply a VIDEO signal (monoscope)
2. Press the "MENU" button on a remote hand unit.
3. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode.
4. Set the adjustment function to "VCJ" by pressing the "AUDIO" button.
5. Select adjustment item "47 VHT" using the "VIDEO" button. Adjust so that the vertical markers are equal using the "ADJUST" button.
6. Select the adjustment item "42 VLR" using the "VIDEO" button
7. Set the adjustment data so that the largest circle is round using the "ADJUST" button.
8. Supply a VIDEO signal (crosshatch).
9. Select the adjustment item "41 VSC"(Vertical S) using the "VIDEO" button.
10. Set the adjustment data so that the height of the squares in the cross hatch signal are equal at the top, bottom and middle of the screen using the "ADJUST" button.
11. Press "ENTER" to write the adjustment data into memory.
12. Press the "MENU" button twice to terminate the circuit adjustment mode.

[Deflection Circuit]**Adjustment purpose** To set the width of the picture.**10. Horizontal Width****Symptom when incorrectly adjusted** Picture compressed or expanded horizontally.

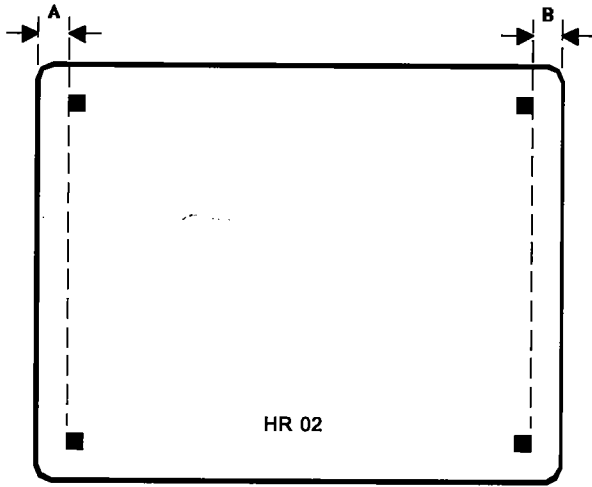
Measuring Instrument	-----
Test Point	-----
Exit Trigger	-----
Measurement range	-----
Input Signal	VIDEO signal (Monoscope)
Input Terminal	VIDEO IN terminal

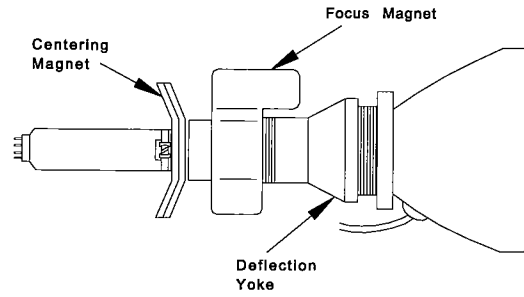
Note: This adjustment must follow item 4 (CRT Cut Off, White Balance) and item 3 (High Voltage Control). Perform this adjustment alternately with item 11 (Raster Distortion Correction).

1. Supply a VIDEO signal (monoscope).
2. Cover the RED and BLUE lenses, producing a GREEN monochrome picture.
3. Press the "MENU" button on a remote hand unit.
4. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode.
5. Set the adjustment function to "CONV GEO" by pressing the "AUDIO" button.
6. Select the adjustment item "0 HWID" using the "VIDEO" button.
7. Set the adjustment data so the sum of the horizontal width markers is 6.0 using the "ADJUST" button.
8. Press "ENTER" to write the adjustment data into memory.
9. Press the "MENU" button twice to terminate the circuit adjustment mode.



[Raster Correction Circuit]		Adjustment purpose	To correct picture distortion.
11. Raster Correction		Symptom when incorrectly adjusted	Distorted picture.
Measuring Instrument		1. Supply a VIDEO signal (Crosshatch) 2. Cover the RED and BLUE lenses, producing a GREEN crosshatch picture. 3. Press the "MENU" button on a remote hand unit. 4. Press the buttons 2-3-5-7 in sequence. (The screen will change to the circuit adjustment mode.) 5. Set the function to "CONV GEO." ("AUDIO" button) 6. Set the data of the items below so that all the green horizontal and vertical lines are straight and spacing is linear. 7. Write the data into memory. (Press "ENTER") 8. Terminate the circuit adjustment mode. (Press "MENU" twice) NOTE: Adjustment 14 (Dynamic Convergence) must be performed immediately after this adjustment.	
Test Point	----		
Exit Trigger	----		
Measurement Range	----		
Input Signal	VIDEO signal (Crosshatch)		
Input Terminal	VIDEO IN terminal		
0 HWID		6 EWPC	
1 TILT		7 VIPC	
2 VBOW		8 HIPC	
3 SKEW		9 HKEY	
4 HBOW		10 VKEY	
5 TBPC		11 VSBW	
		12 VSTL	
		13 V3RD	
		14 V4TH	
		15 HSBW	
		16 HSKW	
		17 H3RD	
		18 HSSS	
		19 HLIN	
		20 HSLN	

[Screen Character Circuit]		Adjustment purpose	To position the character display.
12. Character Position		Symptom when incorrectly adjusted	Incorrect Character position
Measuring Instrument	-----	1. Supply a VIDEO signal (Monscope). 2. Press the "MENU" button on a remote hand unit. 3. Press the buttons 2-3-5-7 in sequence. (The screen will change to the circuit adjustment mode.) 4. Set the function to "HR" using the "AUDIO" button. 5. Using the "ADJUST" button, align so that the widths for A and B are equal.	
Test Point	-----		
Exit Trigger	-----		
Measurement range	-----		
Input Signal	Standard RF Broadcast		
Input Terminal	Antenna A/B		

[CRT]		Adjustment purpose	To correct convergence caused by installation direction.
13. Static Convergence		Symptom when incorrectly adjusted	Color edging.
Measuring Instrument	-----	1. Degauss the shield cover and bracket unit of the CRT assembly and chassis sheet metal. 2. Supply a VIDEO signal (crosshatch). 3. Make sure that the vertical linearity is generally correct. If not, change the adjustment data of "VCJ" item "42 VLR" in the circuit adjustment mode so that the vertical height and linearity is roughly correct. (refer to Adjustment 9). 4. Cover the RED and BLUE lenses with lens caps to produce a GREEN monochrome picture. Rotate the centering magnet attached to the GREEN CRT, so that the center of the displayed crosshatch signal is set at the screen center. 5. Remove lens caps covering the RED and BLUE lenses. 6. Rotate the deflection Yoke and Centering Magnet on the RED CRT, so that the center horizontal line of the displaced RED crosshatch signal is converged on the GREEN signal to produce a yellow horizontal line. 7. Rotate the deflection Yoke and Centering Magnet on the BLUE CRT, so that the center horizontal line of the displaced BLUE crosshatch signal is converged on the GREEN signal to produce a white horizontal line.	
Test Point	-----		
Exit Trigger	-----		
Measurement range	-----		
Input Signal	ViDEO signal (Crosshatch)		
Input Terminal	VIDEO IN terminal		

[Convergence Circuit]	Adjustment purpose To correct color misconvergence in RED, GREEN, and BLUE.
14. Dynamic Convergence	Symptom when incorrectly adjusted Colors misconverged.

Measuring Instrument	-----
Test Point	-----
Exit Trigger	-----
Measurement Range	-----
Input Signal	VIDEO signal (Crosshatch)
Input Terminal	VIDEO IN terminal

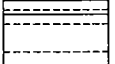
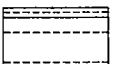
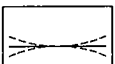
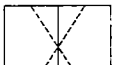
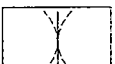
Note: This adjustment must follow item 13 (Static Convergence).

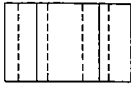
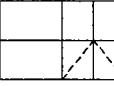
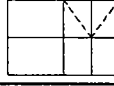
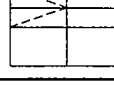
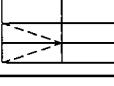
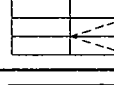
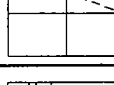
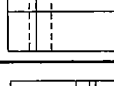
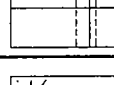
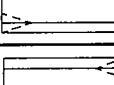
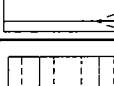
Dynamic convergence should not be attempted until the static convergence has been properly adjusted. (including centering adjustment, if required). Cover the RED or BLUE lens with a lens cap, and adjust the color convergence in GREEN and RED or in GREEN and BLUE.

1. Supply a VIDEO signal (crosshatch).
 2. Press the "MENU" button on a remote hand unit.
 3. Press the numerical buttons 2-3-5-9 in sequence to change the screen to the adjustment mode.
 4. Adjust the convergence according to the steps described below:
 - a. Press the "VIDEO" button to select a specific adjustment item.
 - b. Press the "ADJUST UP/DOWN" button to change adjustment data.
 - c. Press "ENTER" to switch between RED and BLUE.
- Note:** The newly entered data is automatically recorded.
5. Display a red raster and a blue raster. Confirm no black or bright horizontal line appears on the middle of the screen. If a line appears, set the data of the adjustment item "56 DA42" so that the line disappears.
 6. Confirm no misconvergence occurs at the center of the screen. Use the following method to correct center screen misconvergence:
 - a. When in the dynamic convergence adjustment mode, select the items shown in Table A to converge RED and BLUE at the center of the screen.
 7. Press the "MENU" button twice to terminate the dynamic adjustment mode.

Adjustment Item		Description
No.	Abbreviation	
00	HSTA	Red Horizontal Position
01	VSTA	
30	HSTA	Blue Horizontal Position
31	VSTA	

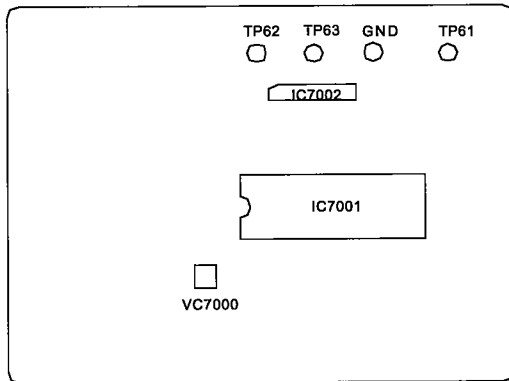
Table A

RED	BLUE	ITEM	ADJUSTMENT METHOD	PICTURE
2 TILT	32 TILT	Vertical Tilt	Merge horizontal center line with Green Line	
6 VWID	36 VWID	Vertical Height	Merge horizontal lines with GREEN lines	
7 VLIN	37 VLIN	Vertical Linearity	Merge horizontal lines with GREEN lines	
3 BOW	33 BOW	Vertical Bow	Merge horizontal center line with Green Line	
4 SKEW	34 SKEW	Skew	Merge vertical center line with Green Line	
5 HBOW	35 HBOW	Horizontal Bow	Merge vertical center line with Green Line	
8 HWID	38 HWID	Horizontal Width	Merge vertical lines with Green Line	

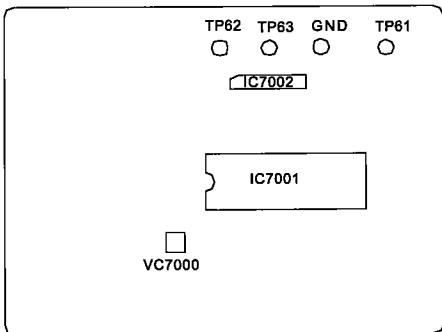
RED	BLUE	ITEM	ADJUSTMENT METHOD	PICTURE
9 HLIN	39 HLIN	Horizontal Linearity	Merge Vertical lines with Green Line	
15 HKLU	45 HKLU	Horizontal Keystone	Merge upper left vertical line with GREEN line	
17 VLIN	47 HKLL	Horizontal Keystone	Merge lower left vertical line with GREEN line	
19 HKRL	49 HKRL	Horizontal Keystone	Merge lower right vertical line with GREEN Line	
21 HKRU	51 HKRU	Horizontal Keystone	Merge upper right vertical line with GREEN Line	
14 VKLU	44 VKLU	Vertical Keystone	Merge upper left horizontal line with GREEN Line	
16 VKLL	46 VKLI	Vertical Keystone	Merge lower left horizontal line with GREEN Line	
18 VKRI	48 VKRL	Vertical Keystone	Merge lower right horizontal line with GREEN Line	
20 VKRU	50 VKRU	Vertical Keystone	Merge upper right horizontal line with GREEN Line	
10 HSDL	40 HSDL	Left Horizontal Side	Merge left Vertical line with Green Line	
11 HSDR	41 HSDR	Right Horizontal Side	Merge right Vertical line with Green Line	
22 LHBW	52 LHBW	Horizontal Sloping Ends	Merge upper and lower left vertical line with GREEN Line	
23 RHBW	53 RHBW	Horizontal Sloping Ends	Merge upper and lower right vertical line with GREEN Line	
24 LVBW	53 LVBW	Vertical Sloping Ends	Merge upper and lower left horizontal line with GREEN Line	
25 RVBW	55 RVBW	Vertical Sloping Ends	Merge upper and lower right horizontal line with GREEN Line	
12 SLIN	12 SLIN	Horizontal Width at the Middle (1)	Merge Vertical lines with Green Line	
13 CLIN	39 HLIN	Horizontal linearity at the Middle (2)	Merge Vertical lines with Green Line	

[PIP Circuit]		Adjustment purpose	Set the clock frequency of PIP.
15. PIP fsc		Symptom when incorrectly adjusted	Interference or no color in the sub picture.
Measuring Instrument	Frequency Counter	1. Supply a Video Color Bar signal input. 2. Select PIP window to display the Color Bar image. 3. Switch INPUT to External signal mode. Do not supply an input signal. 4. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode. 5. Set the adjustment function to "PIP " by pressing the "AUDIO" button. 6. Adjust item #44 FSC from 0 to 2. 7. Observe the frequency at TP61 8. Adjust VC7001 so that the frequency is 3.579545 MHz $\pm$ 50 Hz. 9. Set #44 FSC back to a value of 0. 10. Press "MENU" twice to terminate the circuit adjustment mode.	
Test Point	TP61		
Exit Trigger	-----		
Measurement range	-----		
Input Signal			
Input Terminal			

PCB-PIP/APT (COMPONENT SIDE)



The diagram shows the component side of the PCB-PIP/APT. At the top, there are four test points labeled TP62, TP63, GND, and TP61, each represented by a small circle. Below TP62 and TP63 is a rectangular component labeled IC7002. Further down is a larger rectangular component labeled IC7001. At the bottom left is a small square component labeled VC7000.

[PIP Circuit]		Adjustment purpose	To set the color level between main and sub picture.
16. PIP Chroma Gain		Symptom when incorrectly adjusted	Different color level between main and sub picture.
Measuring Instrument	Oscilloscope	Note: <i>Preheat the set for one minute or more.</i> 1. Supply a VIDEO signal (color bar). 2. Press the "MENU" button on a remote hand unit. 3. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode. 4. Set the adjustment function to "PIP " by pressing the "AUDIO" button. 5. Set all the items in adjustment function "PIP" to the initial data value (refer to page 21) using the "VIDEO and AUDIO" button. 6. Observe the waveform at TP63 (pin 5 of IC7001). 7. Select adjustment item "1 COLOR" using the "VIDEO" button. 8. Set the adjustment data so that the chroma signal amplitude of sub picture is $90 \pm 5\%$ of main picture using the "ADJUST" button (Fig.7). 9. Press the "ENTER" to write the adjustment data into memory. 10. Press the "MENU" button twice to terminate the circuit adjustment mode. Note: <i>Adjustment item 17 (PIP Sub Tint) must be performed immediately after this adjustment.</i>	
Test Point	TP63 (pin 5 of IC7001)		
Exit Trigger	-----		
Measurement range	Division 20mV Time 10 μ s		
Input Signal	VIDEO signal (Color Bar)		
Input Terminal	VIDEO IN terminal		
PCB-PIP/APT (COMPONENT SIDE) 			

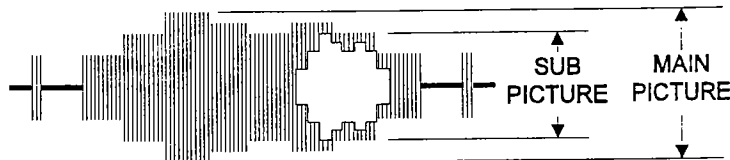
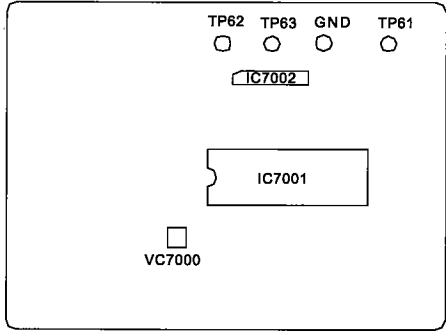
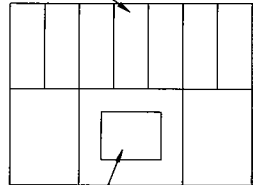


Fig. 7

Fig. 7

[PIP Circuit]		Adjustment purpose To obtain the same hue in the main and sub picture.
17. PIP Sub Tint		Symptom when incorrectly adjusted Different hue between the main and sub picture, and color smear.
Measuring Instrument	-----	Note: Preheat the set for one minute or more. This adjustment must follow item 16 (PIP Chroma Gain) 1. Supply a VIDEO signal (color bar). 2. Activate PIP and display the same picture on main screen and sub picture screen. 3. Press the "MENU" button on a remote hand unit. 4. Press the numerical buttons 2-3-5-7 in sequence to change the screen to the circuit adjustment mode. 5. Set the adjustment function to "PIP " by pressing the "AUDIO" button. 6. Select adjustment item "2 TINT" using the "VIDEO" button. 7. Set the adjustment data so that the sub picture corresponds to the hue in the main picture using the "ADJUST" button. 8. Press the "ENTER" to write the adjustment data into memory. 9. Press the "MENU" button twice to terminate the circuit adjustment mode.
Test Point	-----	
Exit Trigger	-----	
Measurement range	-----	
Input Signal	VIDEO signal (Color Bar)	
Input Terminal	VIDEO IN terminal	

[PIP Circuit]		Adjustment purpose To obtain the proper contrast ratio in the sub picture.
18. PIP Contrast		Symptom when incorrectly adjusted Sub picture too light or too dark.
Measuring Instrument	Oscilloscope	1. Apply Color Bar signal to External Input and select this image on both the Main and PIP pictures. 2. Using the PIP position button on a remote hand unit, adjust to place the PIP window as shown in figure 8 . 3. Connect Oscilloscope probe to TP-62 and observe the waveform. 4. Synchronize the waveform on the Oscilloscope as shown in figure 8. 5. Press the "MENU" button on a remote hand unit. 6. Press the numerical buttons 2-3-5-7 in sequence to enter the circuit adjustment mode. 7. Select the "PIP" function using the "AUDIO" button. 8. Adjust item "0 CONT" using the "ADJUST UP/DOWN" buttons to obtain the waveform ratio shown in figure 7 (Adjustment #16). PIP amplitude should be equal to $90 \pm 5\%$ of Main picture. 9. Press the "ENTER" button to write the adjustment data into memory. 10. Press the "MENU" button twice to terminate the circuit adjustment mode.
Test Point	TP-62	
Exit Trigger		
Measurement range		
Input Signal	VIDEO (Color Bars)	
Input Terminal	VIDEO IN terminal	
PCB-PIP/APT (COMPONENT SIDE) 		

CHIP PARTS REPLACEMENT

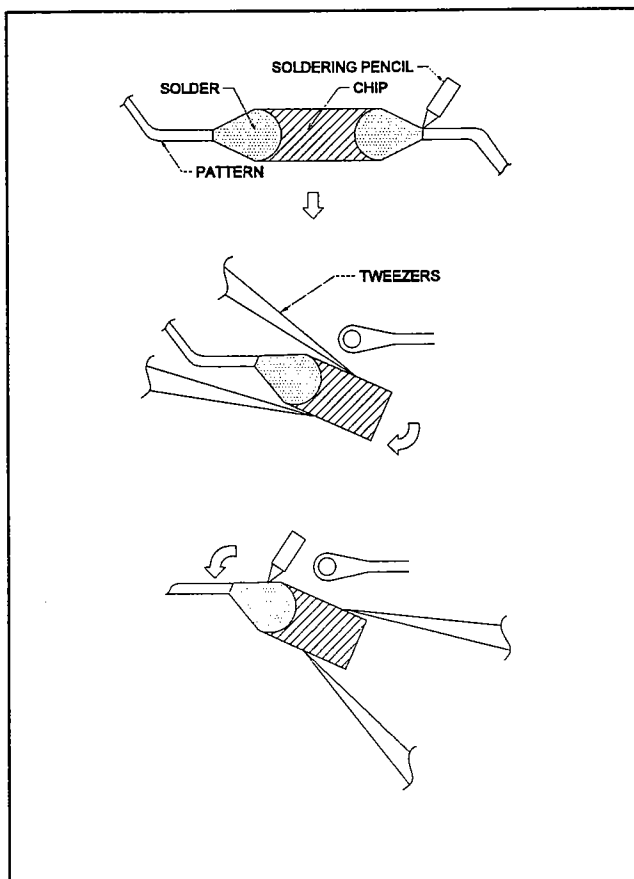
Some resistors, shorting jumpers (0 Ohm resistors), ceramic capacitors, transistors and diodes are chip parts. The following precautions should be taken when replacing these parts.

CAUTIONS:

1. Use a fine tipped, well insulated soldering iron (approximately 30 watts), and tweezers.
2. Melt the solder and remove the chip parts carefully so as not to tear the copper foil from the printed circuit board.
3. Discard removed chips; do not reuse them.
4. Do not apply heat for more than 3 (three) seconds to new chip parts.
5. Avoid using a rubbing stroke when soldering.
6. Take care not to scratch, or damage the chip parts when soldering.
7. Supplementary cementing is not required

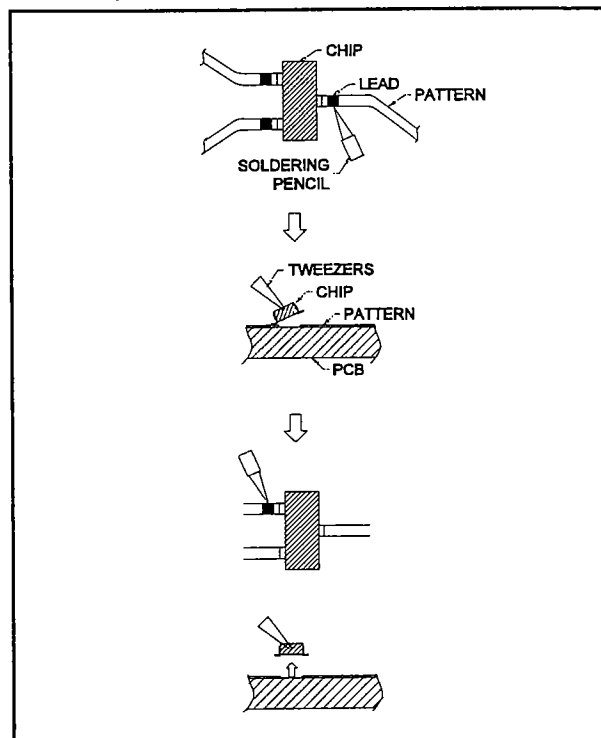
1. Removal of Chip Parts (Resistors, Capacitors, etc)

- A. Grasp the part with tweezers. Melt the solder at both sides alternately and remove one side of the part with a twisting motion.
- B. Melt the solder at the other side and remove the part.



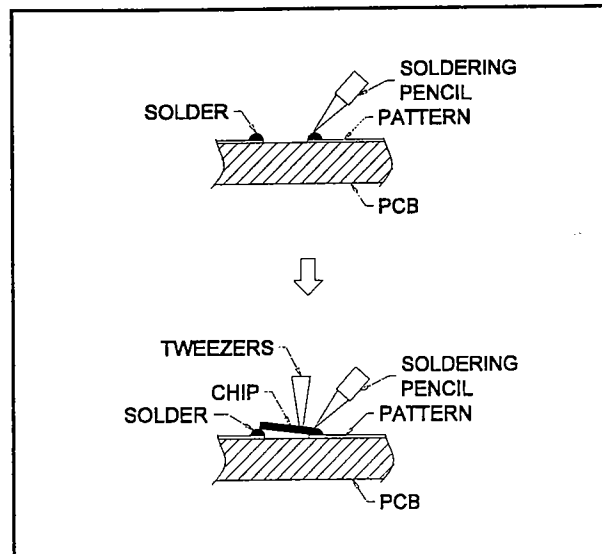
2. Removal of Chip Parts (Transistors)

- A. Melt the solder of one lead and lift the side of that lead upward.
- B. Simultaneously melt the solder of the other two leads and lift the part from the PCB.



3. Replacement

- A. Presolder the contact points on the circuit pattern.
- B. Press the part downward with tweezers and apply the soldering iron as shown



2. Electrical Parts and Others

A. Model : VS-45501/VS-45502/VS-45501A/VS-50501/VS-50502/VS-50501A

In order to expedite delivery of replacement parts orders, specify the following:

1. Model Number/Serial Number
2. Part Number and description
3. Quantity

Note: Unless complete information is supplied, delay in processing of orders will result.

B. Symbol

The electrical parts with shading are critical components, and the parts with * are warranty return items.

 : Critical Components

* : Warranty Items

MARK	B	C	D	F	G	J	K
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10

MARK	M	N	V	X	Z	P	Q
Tolerance %	± 20	± 30	± 10 -10	± 40 - 20	± 80 - 20	± 100 - 0	± 30 -10

MARK	B	C	D	F	G
Tolerance (pF)	± 0.1	± 0.25	± 0.5	± 1	± 2

C. Abbreviation

[45501]	VS-45501
[45502]	VS-45502
[45501A]	VS-45501A
[50501]	VS-50501
[50502]	VS-50502
[50501A]	VS-50501A

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
TUBES				IC903	266P932010	IC	AN7805
*	251C083010	ASSY-CRT	RED-MONOCROME 50501	TRANSISTORS			
			50502	Q 100	260P560040	TRANSISTOR	2SA933S-S
*	251C083020	ASSY-CRT	GREEN-MONOCROME 50501	Q 101	260P560040	TRANSISTOR	2SA933S-S
			50502	Q 102	260P560040	TRANSISTOR	2SA933S-S
*	251C083030	ASSY-CRT	BLUE-MONOCROME 50501	Q 103	260P559030	TRANSISTOR	2SC1740S-S
			50502	Q 104	260P560040	TRANSISTOR	2SA933S-S
*	251C091010	ASSY-CRT	RED-MONOCROME 50501A	Q 105	260P560040	TRANSISTOR	2SA933S-S
*	251C091020	ASSY-CRT	GREEN-MONOCROME 50501A	Q 106	260P560040	TRANSISTOR	2SA933S-S
*	251C091030	ASSY-CRT	BLUE-MONOCROME 50501A	Q 107	260P559030	TRANSISTOR	2SC1740S-S
*	251C083040	ASSY-CRT	RED-MONOCROME 45501	Q 109	260P559030	TRANSISTOR	2SC1740S-S
			45502	Q 110	260P559030	TRANSISTOR	2SC1740S-S
*	251C083050	ASSY-CRT	GREEN-MONOCROME 45501	Q 2H04	260P559030	TRANSISTOR	2SC1740S-S
			45502	Q 2H05	260P559030	TRANSISTOR	2SC1740S-S
*	251C083060	ASSY-CRT	BLUE-MONOCROME 45501	Q 2H06	260P559030	TRANSISTOR	2SC1740S-S
			45502	Q 2H07	260P559030	TRANSISTOR	2SC1740S-S
*	251C091040	ASSY-CRT	RED-MONOCROME 45501A	Q 2H08	260P559030	TRANSISTOR	2SC1740S-S
*	251C091050	ASSY-CRT	GREEN-MONOCROME 45501A	Q 2H09	260P559030	TRANSISTOR	2SC1740S-S
*	251C091060	ASSY-CRT	BLUE-MONOCROME 45501A	Q 2H10	260P560040	TRANSISTOR	2SA933S-S
INTEGRATED CIRCUITS				Q 2H11	260P560040	TRANSISTOR	2SA933S-S
IC200	270P347030	IC	CXA2095S	Q 2H12	260P560040	TRANSISTOR	2SA933S-S
IC2001	274P596020	IC	T90A13N	Q 2K0	260P559030	TRANSISTOR	2SC1740S-S
IC2002	272P658010	IC	MM1031XS	Q 2030	260P559050	TRANSISTOR	2SC1740S-E
IC203	270P210010	IC	AN7809F	Q 2040	260P559050	TRANSISTOR	2SC1740S-E
IC204	270P204010	IC	PA0057A	Q 2050	260P559050	TRANSISTOR	2SC1740S-E
IC3A1	272P440010	IC	LA4282	Q 2051	260P559050	TRANSISTOR	2SC1740S-E
IC3E1	270P467010	IC	TDA9855	Q 2052	260P559050	TRANSISTOR	2SC1740S-E
IC401	270P064020	IC	LA7845	Q 206	260P559030	TRANSISTOR	2SC1740S-S
IC5A00	272P106030	IC	UPC4570HA	Q 208	260P559030	TRANSISTOR	2SC1740S-S
IC5A01	266P154010	IC	UPC393C	Q 209	260P559030	TRANSISTOR	2SC1740S-S
IC700	274P762090	IC-MOS	M37270EFSP	Q 210	260P560040	TRANSISTOR	2SA933S-S
IC7001	275P039020	IC	M65617SP-A	Q 211	260P559030	TRANSISTOR	2SC1740S-S
IC7002	272P761010	IC	MM1041XS	Q 212	260P559030	TRANSISTOR	2SC1740S-S
IC7003	272P658010	IC	MM1031XS	Q 213	260P559030	TRANSISTOR	2SC1740S-S
IC7004	270P465010	IC	NJM317	Q 214	260P559030	TRANSISTOR	2SC1740S-S
IC701	274P333010	IC-MOS	24C04A*P	Q 215	260P559030	TRANSISTOR	2SC1740S-S
IC702	266P130030	IC	PST520E	Q 216	260P560040	TRANSISTOR	2SA933S-S
IC703	275P040090	IC	M38123E6SP	Q 217	260P559030	TRANSISTOR	2SC1740S-S
IC705	263P265010	IC	HD74HC32P	Q 220	260P385020	TRANSISTOR	2SC2229-Y
IC706	274P333010	IC-MOS	24C04A*P	Q 221	260P385020	TRANSISTOR	2SC2229-Y
IC7601	270P321020	IC	CXA1855S	Q 222	260P385020	TRANSISTOR	2SC2229-Y
IC8C00	266P154010	IC	UPC393C	Q 224	260P560040	TRANSISTOR	2SA933S-S
IC8D00	270P202010	IC	CM0001AS	Q 225	260P559030	TRANSISTOR	2SC1740S-S
IC8E00	270P202010	IC	CM0001AS	Q 3A1	260P559030	TRANSISTOR	2SC1740S-S
IC8F00	272P106020	IC	UPC4574C	Q 3A2	260P559030	TRANSISTOR	2SC1740S-S
IC8G00	270P357010	IC	PM0002B	Q 3A3	260P559030	TRANSISTOR	2SC1740S-S
IC8W00	267P077020	HIC	STK391-020	Q 3A4	260P560040	TRANSISTOR	2SA933S-S
IC8W01	267P077020	HIC	STK391-020	Q 3E01	260P559030	TRANSISTOR	2SC1740S-S
IC8W02	267P077020	HIC	STK391-020	Q 3E02	260P603010	TRANSISTOR	UN4112 /2
IC800	270P203020	IC	M52336ASP	Q 3E03	260P632010	TRANSISTOR	DTC124ES
IC870	274P713010	IC-MOS	CD0006BD	Q 3E04	260P559030	TRANSISTOR	2SC1740S-S
IC9A00	270P466020	IC	KIA7809PI	Q 5A00	260P797020	TRANSISTOR	2SD2349
IC9A01	270P466010	IC	KIA7805PI	Q 5A01	260P422010	TRANSISTOR	2SC2482
IC9A02	270P466030	IC	KIA7812PI	Q 5A02	260P797020	TRANSISTOR	2SD2349
IC9A12	270P466010	IC	KIA7805PI	Q 5A03	260P559050	TRANSISTOR	2SC1740S-E
IC900	267P129010	HIC	STR-M6811	Q 5A04	260P559050	TRANSISTOR	2SC1740S-E
IC901	267P126010	HIC	SE130N	Q 5A05	260P559030	TRANSISTOR	2SC1740S-S
IC902	272P240010	IC	M5237L	Q 5A06	260P560040	TRANSISTOR	2SA933S-S
				Q 5A07	260P422010	TRANSISTOR	2SC2482

MODEL: VS-45501/VS-45502/VS-45501A/VS-50501/VS-50502/VS-50501A

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
Q 5A08	260P420O20	TRANSISTOR	2SC2073-B,C	Q 800	260P559O30	TRANSISTOR	2SC1740S-S
Q 5H03	260P559O50	TRANSISTOR	2SC1740S-E	Q 9A00	260P646O10	TRANSISTOR	2SC1845-F,E
Q 5H04	260P559O50	TRANSISTOR	2SC1740S-E	Q 900	260P559O50	TRANSISTOR	2SC1740S-E
Q 5H05	260P559O50	TRANSISTOR	2SC1740S-E	Q 904	260P652O10	TRANSISTOR	2SA1725
Q 5H06	260P559O50	TRANSISTOR	2SC1740S-E	DIODES			
Q 5H07	260P559O50	TRANSISTOR	2SC1740S-E	D 100	264P502O10	DIODE	HZ5ALL
Q 5H08	260P559O50	TRANSISTOR	2SC1740S-E	D 101	264P502O10	DIODE	HZ5ALL
Q 5H09	260P559O50	TRANSISTOR	2SC1740S-E	D 102	264P488O20	DIODE	RD13FB1
Q 5H10	260P560O40	TRANSISTOR	2SA933S-S	D 104	264P470O40	DIODE	RD33EB1/2
Q 5H11	260P573O20	TRANSISTOR	2SB940A-P	D 2H00	264P045O40	DIODE	1S2471OM
Q 5H12	260P574O20	TRANSISTOR	2SD1264A-P	D 210	264P486O50	DIODE	RD9.1FB2
Q 5H13	260P559O50	TRANSISTOR	2SC1740S-E	D 211	264P045O40	DIODE	1S2471OM
Q 5H14	260P559O30	TRANSISTOR	2SC1740S-S	D 216	264P483O70	DIODE	RD5.1FB1
Q 5K00	260P664O30	TRANSISTOR	2SC4636	D 217	264P502O20	DIODE	HZ5BLL
Q 5K01	260P664O30	TRANSISTOR	2SC4636	D 218	264P045O40	DIODE	1S2471OM
Q 5K02	260P559O50	TRANSISTOR	2SC1740S-E	D 219	264P045O40	DIODE	1S2471OM
Q 5K03	260P560O40	TRANSISTOR	2SA933S-S	D 220	264P483O80	DIODE	RD5.1FB2
Q 5K04	260P559O50	TRANSISTOR	2SC1740S-E	D 221	264P045O40	DIODE	1S2471OM
Q 6B0	261P004O10	TRANSISTOR	2SC3271F-N,P	D 222	264P045O40	DIODE	1S2471OM
Q 6B1	260P469O30	TRANSISTOR	2SA1321	D 223	264P045O40	DIODE	1S2471OM
Q 6B2	260P307O20	TRANSISTOR	2SC3334	D 224	264P045O40	DIODE	1S2471OM
Q 6G0	261P004O10	TRANSISTOR	2SC3271F-N,P	D 225	264P045O40	DIODE	1S2471OM
Q 6G1	260P469O30	TRANSISTOR	2SA1321	D 226	264P501O50	DIODE	HZ3BLL
Q 6G2	260P307O20	TRANSISTOR	2SC3334	D 227	264P502O30	DIODE	HZ5CLL
Q 6G5	260P560O40	TRANSISTOR	2SA933S-S	D 228	264P045O40	DIODE	1S2471OM
Q 6R0	261P004O10	TRANSISTOR	2SC3271F-N,P	D 229	264P045O40	DIODE	1S2471OM
Q 6R1	260P469O30	TRANSISTOR	2SA1321	D 230	264P045O40	DIODE	1S2471OM
Q 6R2	260P307O20	TRANSISTOR	2SC3334	D 3A3	264P501O40	DIODE	HZ3ALL
Q 7A00	260P559O30	TRANSISTOR	2SC1740S-S	D 3A4	264P045O40	DIODE	1S2471OM
Q 7A01	260P560O40	TRANSISTOR	2SA933S-S	D 3A5	264P045O40	DIODE	1S2471OM
Q 7C00	260P559O30	TRANSISTOR	2SC1740S-S	D 3A6	264P045O40	DIODE	1S2471OM
Q 7C10	260P559O30	TRANSISTOR	2SC1740S-S	D 3A7	264P045O40	DIODE	1S2471OM
Q 7000	260P559O30	TRANSISTOR	2SC1740S-S	D 3E00	264P045O40	DIODE	1S2471OM
Q 7006	260P559O30	TRANSISTOR	2SC1740S-S	D 401	264D056O20	DIODE	ERB12-02RK/3
Q 7007	260P559O30	TRANSISTOR	2SC1740S-S	D 402	264D056O20	DIODE	ERB12-02RK/3
Q 7008	260P559O30	TRANSISTOR	2SC1740S-S	D 403	264D056O20	DIODE	ERB12-02RK/3
Q 701	260P559O30	TRANSISTOR	2SC1740S-S	D 5A00	264P045O40	DIODE	1S2471OM
Q 7011	260P559O30	TRANSISTOR	2SC1740S-S	D 5A02	264P045O40	DIODE	1S2471OM
Q 7013	260P559O30	TRANSISTOR	2SC1740S-S	D 5A03	264P045O40	DIODE	1S2471OM
Q 7014	260P559O30	TRANSISTOR	2SC1740S-S	D 5A04	264P045O40	DIODE	1S2471OM
Q 7016	260P559O30	TRANSISTOR	2SC1740S-S	D 5A06	264P045O40	DIODE	1S2471OM
Q 7017	260P560O40	TRANSISTOR	2SA933S-S	D 5A07	264P045O40	DIODE	1S2471OM
Q 7018	260P560O40	TRANSISTOR	2SA933S-S	D 5A09	264P244O30	DIODE	HZT22-02
Q 7019	260P559O30	TRANSISTOR	2SC1740S-S	D 5A11	264P045O40	DIODE	1S2471OM
Q 703	260P560O40	TRANSISTOR	2SA933S-S	D 5A20	264P469O70	DIODE	RD27EB4/2
Q 704	260P559O30	TRANSISTOR	2SC1740S-S	D 5A21	264P045O40	DIODE	1S2471OM
Q 705	260P560O40	TRANSISTOR	2SA933S-S	D 5A22	264P045O40	DIODE	1S2471OM
Q 706	260P559O30	TRANSISTOR	2SC1740S-S	D 5A23	264P045O40	DIODE	1S2471OM
Q 708	260P559O30	TRANSISTOR	2SC1740S-S	D 5H00	264P045O40	DIODE	1S2471OM
Q 709	260P560O40	TRANSISTOR	2SA933S-S	D 5H01	264P045O40	DIODE	1S2471OM
Q 710	260P560O40	TRANSISTOR	2SA933S-S	D 5H02	264P045O40	DIODE	1S2471OM
Q 711	260P560O40	TRANSISTOR	2SA933S-S	D 5H03	264D056O20	DIODE	ERB12-02RK/3
Q 712	260P559O30	TRANSISTOR	2SC1740S-S	D 5H04	264D056O20	DIODE	ERB12-02RK/3
Q 713	260P560O40	TRANSISTOR	2SA933S-S	D 5H09	264P045O40	DIODE	1S2471OM
Q 714	260P559O30	TRANSISTOR	2SC1740S-S	D 5K01	264P528O30	DIODE	RP 1H
Q 7601	260P559O30	TRANSISTOR	2SC1740S-S	D 5K02	264P543O10	DIODE	EG01
Q 7602	260P559O30	TRANSISTOR	2SC1740S-S	D 5K03	264P543O10	DIODE	EG01
Q 7603	260P560O40	TRANSISTOR	2SA933S-S	D 5K10	264P528O30	DIODE	RP 1H
Q 7670	260P559O30	TRANSISTOR	2SC1740S-S				
Q 7671	260P559O30	TRANSISTOR	2SC1740S-S				
Q 8F00	260P559O30	TRANSISTOR	2SC1740S-S				

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
D 6B0	264P045040	DIODE	1S24710M	D 910	264P722010	DIODE	SF64
D 6B3	264P045040	DIODE	1S24710M	D 912	264P724010	DIODE	STF14
D 6G0	264P045040	DIODE	1S24710M	D 913	264P722010	DIODE	SF64
D 6G3	264P045040	DIODE	1S24710M	D 914	264P718010	DIODE	FR155
D 6R0	264P045040	DIODE	1S24710M	FILTERS			
D 6R3	264P045040	DIODE	1S24710M	CF200	299P128010	CERAMIC-OSC	CSB500F2
D 600	264P457080	DIODE	RD3.3EB1				
D 7A00	264P212020	LED	LN31GPH	DELAY LINES			
D 7001	264P045040	DIODE	1S24710M	DL201	337P134010	DELAY-LINE	SDL-4256
D 7002	264P045040	DIODE	1S24710M				
D 701	264P486020	DIODE	RD8.2FB3				
D 702	264P483070	DIODE	RD5.1FB1	DL5H01	337P147020	DELAY-LINE	
D 703	264P483070	DIODE	RD5.1FB1				
D 704	264P483070	DIODE	RD5.1FB1	DL5H02	337P147020	DELAY-LINE	
D 706	264P483070	DIODE	RD5.1FB1				
D 707	264P483070	DIODE	RD5.1FB1	COILS			
D 708	264P483070	DIODE	RD5.1FB1		330P209040	DEFLECTION YOKE	VZ4-7-90
D 709	264P483070	DIODE	RD5.1FB1				
D 715	264P045040	DIODE	1S24710M		338P046010	CPM-ASSY	DBV4001M
D 716	264P045040	DIODE	1S24710M	L 100	325C111030	COIL-PEAKING	10MH-K
D 717	264P045040	DIODE	1S24710M	L 101	325C111030	COIL-PEAKING	10MH-K
D 718	264P483070	DIODE	RD5.1FB1	L 102	325C111030	COIL-PEAKING	10MH-K
D 719	264D056020	DIODE	ERB12-02RK/3	L 103	325C111030	COIL-PEAKING	10MH-K
D 720	264P483070	DIODE	RD5.1FB1	L 104	325C111030	COIL-PEAKING	10MH-K
D 721	264P483070	DIODE	RD5.1FB1	L 105	325C168070	COIL-PEAKING	1000MH-J
D 722	264P483070	DIODE	RD5.1FB1	L 106	325C111030	COIL-PEAKING	10MH-K
D 723	264P483070	DIODE	RD5.1FB1	L 107	325C111030	COIL-PEAKING	10MH-K
D 724	264P483070	DIODE	RD5.1FB1	L 108	325C111030	COIL-PEAKING	10MH-K
D 725	264P483070	DIODE	RD5.1FB1	L 109	325C121030	COIL-PEAKING	10MH-K
D 727	264P483070	DIODE	RD5.1FB1	L 110	325C111030	COIL-PEAKING	10MH-K
D 728	264P045040	DIODE	1S24710M	L 111	325C168070	COIL-PEAKING	1000MH-J
D 729	264D056020	DIODE	ERB12-02RK/3	L 112	325C111030	COIL-PEAKING	10MH-K
D 730	264P045040	DIODE	1S24710M	L 201	325C121030	COIL-PEAKING	10MH-K
D 731	264P045040	DIODE	1S24710M	L 2010	325C121030	COIL-PEAKING	10MH-K
D 7601	264P485060	DIODE	RD7.5FB2	L 2011	325C121030	COIL-PEAKING	10MH-K
D 7602	264P485060	DIODE	RD7.5FB2	L 2012	325C121030	COIL-PEAKING	10MH-K
D 7603	264P485060	DIODE	RD7.5FB2	L 2031	325C121080	COIL-PEAKING	27MH-K
D 7604	264P486060	DIODE	RD9.1FB3	L 2040	325C121080	COIL-PEAKING	27MH-K
D 7605	264P486060	DIODE	RD9.1FB3	L 2050	325C121080	COIL-PEAKING	27MH-K
D 7606	264P045040	DIODE	1S24710M	L 2069	325C121030	COIL-PEAKING	10MH-K
D 7607	264P045040	DIODE	1S24710M	L 211	325C122050	COIL-PEAKING	100MH-K
D 7608	264P486060	DIODE	RD9.1FB3	L 212	325C121030	COIL-PEAKING	10MH-K
D 7609	264P486060	DIODE	RD9.1FB3	L 214	325C166070	COIL-PEAKING	22MH-J
D 8C01	264P045040	DIODE	1S24710M	L 215	325C121090	COIL-PEAKING	33MH-K
D 8C02	264P425010	DIODE	ISS88	L 3F01	325C111030	COIL-PEAKING	10MH-K
D 800	264P483080	DIODE	RD5.1FB2	L 401	321C130010	COIL-RF	2.0MH +-15%
D 9A00	264P718020	DIODE	FR156	L 411	325C401030	COIL-PEAKING	10MH-J
D 9A01	264P720010	DIODE	KBP202G	L 412	411P001010	LEAD-FERRITE	
D 9A02	264P470080	DIODE	EQA02-32C/2	L 5A00	351P156020	COIL-CHOKE	YT-4361-1 2.4
D 9A03	264P045040	DIODE	1S24710M	L 5A01	351P156010	COIL-CHOKE	YT-4360-1 3.1
D 9A04	264P045040	DIODE	1S24710M	L 5A02	333P040060	COIL-HORIZ-LINEARITY	
D 9A05	264P045040	DIODE	1S24710M	L 5A03	411P001010	LEAD-FERRITE	
D 9A06	264P825010	DIODE	ERA15-02	L 5A04	411P001010	LEAD-FERRITE	
D 900	264P721010	DIODE	TS6B06G	L 5A05	321C030070	COIL-RF	3.3MH-K
D 901	264P487080	DIODE	RD12FB2	L 5A06	411P001010	LEAD-FERRITE	
D 903	264P522010	DIODE	RU 1P	L 5H00	411D009020	CORE-FERRITE	
D 904	264P724010	DIODE	STF14	L 5K00	411P001040	LEAD-FERRITE	
D 906	264P578010	DIODE	RG 2A	L 6B0	325C402020	COIL-PEAKING	56MH-J
D 907	264P588010	DIODE	FML-G16S	L 6B1	325C402020	COIL-PEAKING	56MH-J
D 908	264P722010	DIODE	SF64	L 6G0	325C402020	COIL-PEAKING	56MH-J
D 909	264P719010	DIODE	FR302	L 6G1	325C402020	COIL-PEAKING	56MH-J

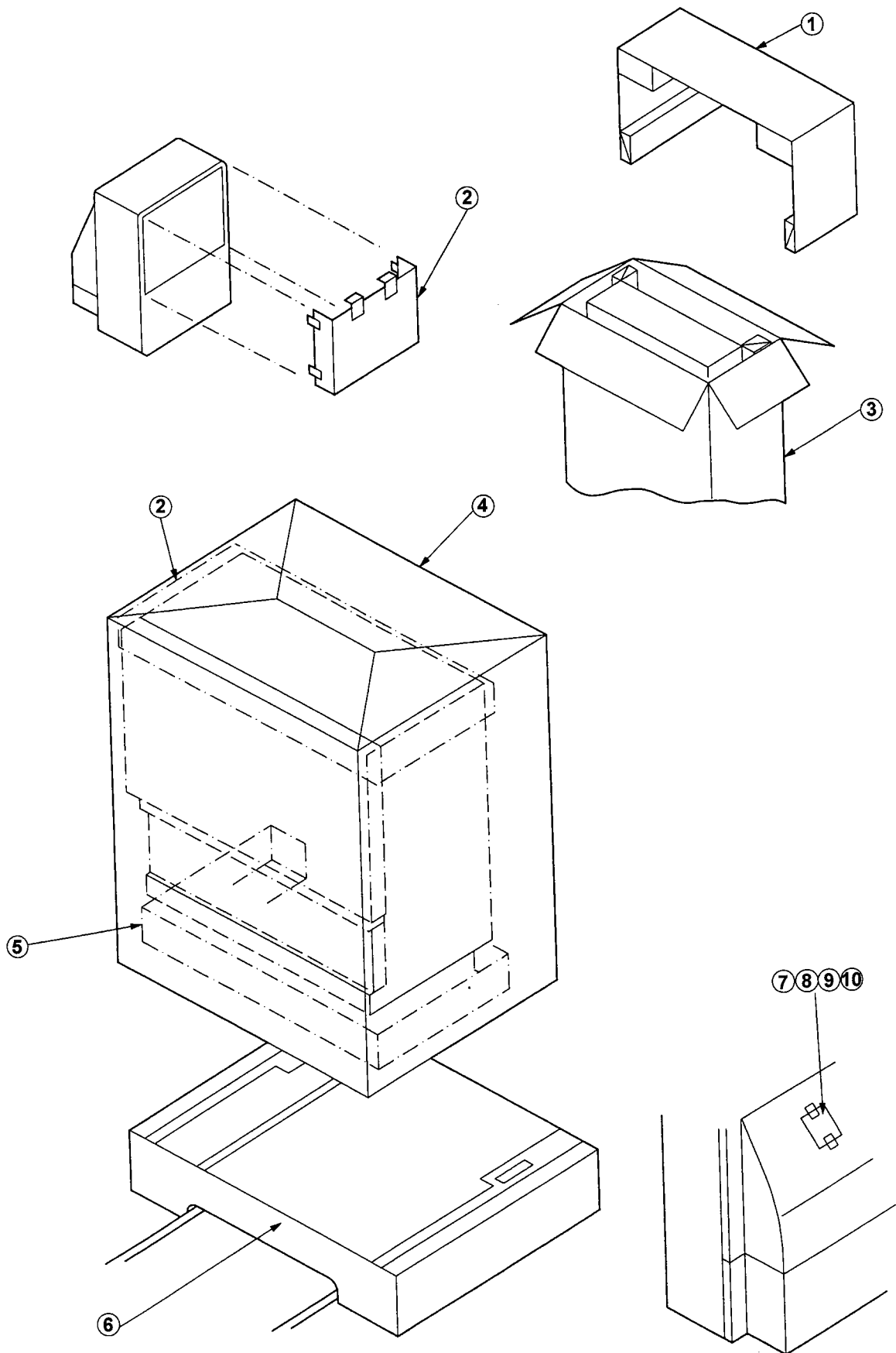
MODEL: VS-45501/VS-45502/VS-45501A/VS-50501/VS-50502/VS-50501A

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
L 6R0	325C402020	COIL-PEAKING	56MH-J	T 5A01	336P031010	COIL-HORIZ-DRIVE	
L 6R1	325C402020	COIL-PEAKING	56MH-J	T 5A02	336P031010	COIL-HORIZ-DRIVE	
L 7000	325C110050	COIL-PEAKING	2.2MH-K				
L 7001	325C110030	COIL-PEAKING	1.5MH-K				
L 7002	325C121030	COIL-PEAKING	10MH-K				
L 7003	325C121030	COIL-PEAKING	10MH-K				
L 7004	325C121030	COIL-PEAKING	10MH-K				
L 7006	325C121030	COIL-PEAKING	10MH-K				
L 7007	325C121030	COIL-PEAKING	10MH-K				
L 7008	325C121030	COIL-PEAKING	10MH-K				
L 701	325C121030	COIL-PEAKING	10MH-K				
L 702	325C121030	COIL-PEAKING	10MH-K				
L 703	325C121030	COIL-PEAKING	10MH-K				
L 704	325C121030	COIL-PEAKING	10MH-K				
L 705	325C121030	COIL-PEAKING	10MH-K				
L 706	325C121030	COIL-PEAKING	10MH-K				
L 707	325C165070	COIL-PEAKING	3.3MH-J				
L 708	325C401000	COIL-PEAKING	5.6MH-J				
L 709	325C121030	COIL-PEAKING	10MH-K				
L 710	325C165070	COIL-PEAKING	3.3MH-J				
L 711	325C166030	COIL-PEAKING	10MH-J				
L 714	321C114070	COIL-RF	6800MH-J				
L 715	325C121030	COIL-PEAKING	10MH-K				
L 716	325C121030	COIL-PEAKING	10MH-K				
L 7601	325C166030	COIL-PEAKING	10MH-J				
L 7602	325C166030	COIL-PEAKING	10MH-J				
L 77A1	325C121030	COIL-PEAKING	10MH-K				
L 8D01	321C031040	COIL-RF	10MH-K				
L 8E01	321C031040	COIL-RF	10MH-K				
L 8F01	321C031040	COIL-RF	10MH-K				
L 8F02	321C031040	COIL-RF	10MH-K				
L 8W01	321C031040	COIL-RF	10MH-K				
L 8W02	321C031040	COIL-RF	10MH-K				
L 8W03	321C031040	COIL-RF	10MH-K				
L 8W04	321C031040	COIL-RF	10MH-K				
L 8W05	321C031040	COIL-RF	10MH-K				
L 8W06	321C031040	COIL-RF	10MH-K				
L 800	321C031040	COIL-RF	10MH-K				
L 802	321C031040	COIL-RF	10MH-K				
L 803	321C031040	COIL-RF	10MH-K				
L 900	351P139010	LINE-FILTER	SS35V-30082				
L 902	351P155010	COIL	YT-4388-1				
L 903	351P155010	COIL	YT-4388-1				
L 904	351P155010	COIL	YT-4388-1				
L 905	351P155010	COIL	YT-4388-1				
L 907	321C142030	COIL-RF	68MH-K 9X9.5				
L 908	321C142030	COIL-RF	68MH-K 9X9.5				
L 909	411P001010	LEAD-FERRITE					
L 910	411P001010	LEAD-FERRITE					
L 911	411P001010	LEAD-FERRITE					
L 912	411P001060	LEAD-FERRITE					
L 913	411D009020	CORE-FERRITE					
L 914	411D009020	CORE-FERRITE					
L 925	411D009020	CORE-FERRITE					
LC2091	409P402030	EMI-FILTER	FZ103N100				
LC2092	409P402030	EMI-FILTER	FZ103N100				
LC701	409P402010	EMI-FILTER	B101M100				
LC702	409P402010	EMI-FILTER	B101M100				
LC703	409P402010	EMI-FILTER	B101M100				
LC704	409P402010	EMI-FILTER	B101M100				
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SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
R 927	109D036030	R-COMP	1/2W 1.0M-K		449C134010	SOCKET-CRT	
R 928	109D036030	R-COMP	1/2W 1.0M-K		480P039010	SPEAKER	A(102-118)FL-1
R 931	109D021070	R-SOLID	1/2W 1.5M-K		AG5K00	224D019040	AIR-GAP 2KV
CAPACITORS AND TRIMMERS					AG900	224D019040	AIR-GAP 2KV
C 408	189P071050	C-M-PP	200V 0.33MF-J		F 900	283D060020	FUSE-UL S5A
C 5A04	172P172070	C-M-PP	1600V 4300PF-J		F 901	283D038070	FUSE-UL S4A
C5A00	172P081080	C-P-PP	200V 0.033MF-K		F 902	283D038070	FUSE-UL S4A
C 5A05	172P172070	C-M-PP	1600V 4300PF-J		K 900	287P049070	RELAY-POWER DJ12D1-0(M)
C5A12	172P330071	C-P	50V 3300PF-J		PC900	268P033010	PHOTO-COUPLER ON3161-R
C 5A13	172P170090	C-M-PP	1600V 4700PF-J		PJ701	451C129010	JACK-MICROPHONE
C 5A14	172P170090	C-M-PP	1600V 4700PF-J		PJ7601	440C323010	PIN JACK BOARD 3PIN
C 5A16	189P081060	C-M-PP	200V 0.15MF-J		PJ7602	440C186020	JACK-BOARD PINX6 & SX2
C 5A17	189P081060	C-M-PP	200V 0.15MF-J		PJ79A0	440C231010	JACK-BOARD PINX3 & SX1
C 5A27	189P071080	C-M-PP	200V 0.47MF-J		PT7A00	264P723010	LED SFH310-3
C5A32	72P262051	C-M-P	50V 0.1MF-J		TU101	295P420030	TUNER ENG26104G
C 5A35	154P264060	C-C	3.15KV 470P-K		TU102	295P420030	TUNER ENG26104G
C 5K00	172P171060	C-M-PP	1600V 0.018MF-J		X 200	285P066010	QUARTZ-CRYSTAL 3.5795MHZ
C 5K01	172P171060	C-M-PP	1600V 0.018MF-J		X 3E1	299P208010	CERAMIC-OSC C5B503F58
C 900	189P153040	C-M-P-AC	AC250V 0.1MF-M		X 7000	285P069020	QUARTZ-CRYSTAL HC-49/U
C 901	189P067060	C-C-AC	B VA1 1000PF-M		X 701	285P039020	QUARTZ-CRYSTAL 8.00MHZ
C 902	189P067060	C-C-AC	B VA1 1000PF-M		X 702	285P326010	QUARTZ-CRYSTAL 6.30MHZ
C 903	189P134080	C-C-AC	F VA1 2200PF-M		Z 7706	939P296060	UNIT-PREAMP HC-437ME
C 904	189P134080	C-C-AC	F VA1 2200PF-M		Z 900	283P039020	FUSE SSFR 6.3A
C 905	189P134080	C-C-AC	F VA1 2200PF-M		Z 901	283P039020	FUSE SSFR 6.3A
C 906	189P134080	C-C-AC	F VA1 2200PF-M		Z 902	283P030090	FUSE SSFR 4A
C 907	185D063030	C-ELE	H180V 820MF-M 105C		Z 903	283P039020	FUSE SSFR 6.3A
C 908	185D063030	C-ELE	H180V 820MF-M 105C		Z 905	283P030060	FUSE SSFR 2A
C 917	185D063020	C-ELE	H180V 470MF-M 105C		PRINTED CIRCUIT BOARDS		
C 920	185D062050	C-ELE	H50V 4700MF-M		*	935D326001	ASSY-PWB-AV
C 928	185D062050	C-ELE	H50V 4700MF-M		*	935D317001	ASSY-PWB-CONTROL
C 931	189P153040	C-M-P-AC	AC250V 0.1MF-M		*	935C747001	ASSY-PWB-CONV 50501
C 938	189P152050	C-M-P-AC	AC125V 4700PF-M		*	935C747002	ASSY-PWB-CONV 45501
C 944	189P152050	C-M-P-AC	AC125V 4700PF-M		*	935C750001	ASSY-PWB-CRT
C 952	189P134080	C-C-AC	F VA1 2200PF-M		*	935D323001	ASSY-PWB-DBF 50501
C 953	189P134080	C-C-AC	F VA1 2200PF-M		*	935D323002	ASSY-PWB-DBF 45501
VC7000	202P109010	C-TRIMMER	3PF-10PF		*	935D321001	ASSY-PWB-FRONT
SWITCHES					*	935C745001	ASSY-PWB-MAIN 50501
S 7A00	432P100010	SW-KEY-BOARD	1-1 H=4.3		*	935C745002	ASSY-PWB-MAIN 45501
S 7A01	432P100010	SW-KEY-BOARD	1-1 H=4.3		*	935D314001	ASSY-PWB-PIP/APT
S 7A02	432P100010	SW-KEY-BOARD	1-1 H=4.3		*	935D316001	ASSY-PWB-PREAMP
S 7A03	432P100010	SW-KEY-BOARD	1-1 H=4.3		*	935C746001	ASSY-PWB-SIGNAL
S 7A04	432P100010	SW-KEY-BOARD	1-1 H=4.3		*	935C746006	ASSY-PWB-SIGNAL 45501A
S 7A05	432P100010	SW-KEY-BOARD	1-1 H=4.3		*	935D354001	ASSY-PWB-SVM
S 7A06	432P100010	SW-KEY-BOARD	1-1 H=4.3		MECHANICAL PARTS		
S 7A07	432P100010	SW-KEY-BOARD	1-1 H=4.3			669D212010	SCREW-TB-BIND 3X12 *10
S 7A08	432P100010	SW-KEY-BOARD	1-1 H=4.3			669D220030	SCREW-TB 3X10 46LA005 *10
TU 103	295P421020	2RF-SW	ENPE624			669D220060	SCREW-TB 3X16 46LA005 *10
MISCELLANEOUS						669D221040	SCREW-TB 4X12 46LA005 *10
	453B027010	CAP-ANODE					
	453B027020	CAP-ANODE					
	767D048030	MIRROR	VS-50501				
	767C048040	MIRROR	VS-45501				

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
COSMETIC PARTS				PACKING PARTS AND ACCESSORIES			
	246C160O20	AC-POWER-CORD		1	802B620010	PACKING CASE	45501
	740A365O10	CABINET	50501	1	802B620O30	PACKING CASE	50501
	740A383O10	CABINET	45501	2	829D176O20	PACKING SHEET	45501/50501
	701B360O20	FRAME-SCREEN	50501	3	802B610010	PACKING CASE	45501
	701B363O20	FRAME-SCREEN S	50501	3	802B610O30	PACKING CASE	50501
	701B360O10	FRAME-SCREEN	45501	4	831C060O40	PACKING-BAG	45501/50501
	701B363O10	FRAME-SCREEN S	45501	5	829D126O90	PACKING-SHEET	45501/50501
	622C53O10	HOLDER-SCREEN	50501	6	802B630O10	PACKING TRAY	45501
	622D539O50	CUSHION	50501	6	802B630O30	PACKING TRAY	50501
	622D673O10	CUSHION	50501	7	831D191O30	PACKING-BAG	45501/50501
	700C245O60	BACK BOARD	50501	8	871D223O10	IB	50501
	622C053O20	HOLDER-SCREEN	45501	9	242D266O40	CABLE	PLUG-PLUG (3.5)
	622D539O20	CUSHION	45501	10	290P080O20	REMOTE HAND UNIT	50501
	622D673O20	CUSHION	45501				
	700C245O80	BACK BOARD	45501				
	700C240O90	BACK BOARD	45501A				
	641D173O10	CLIP	AC-PWR-CORD				
	761C273O10	DOOR-CATCH	45501/50501				
	703B024O10	DOOR	50501				
	720C188O10	COVER-FRONT	50501				
	702A375O20	PANEL-CONTROL	50501				
	702A375O10	PANEL-CONTROL	45501				
	761A102O30	GRILLE-SPEAKER	50501				
	761A148O10	GRILLE-SPEAKER	45501				
	490P138O10	LENS UNIT	45501/50501				
	490P138O20	LENS UNIT	45501/50501				
	490P138O30	LENS UNIT	45501/50501				
	490P154O10	LENS UNIT	45501/50501				
	491P031O70	SCREEN-LENTICULAR	50501				
	491P043O80	LENS-FRESNEL	50501				
	491P035O50	SCREEN-LENTICULAR	45501				
	491P044O80	LENS-FRESNEL	45501				
	702A377O10	SCREEN CAP	45501/50501				
	702A377O20	SCREEN CAP	45501/50501				

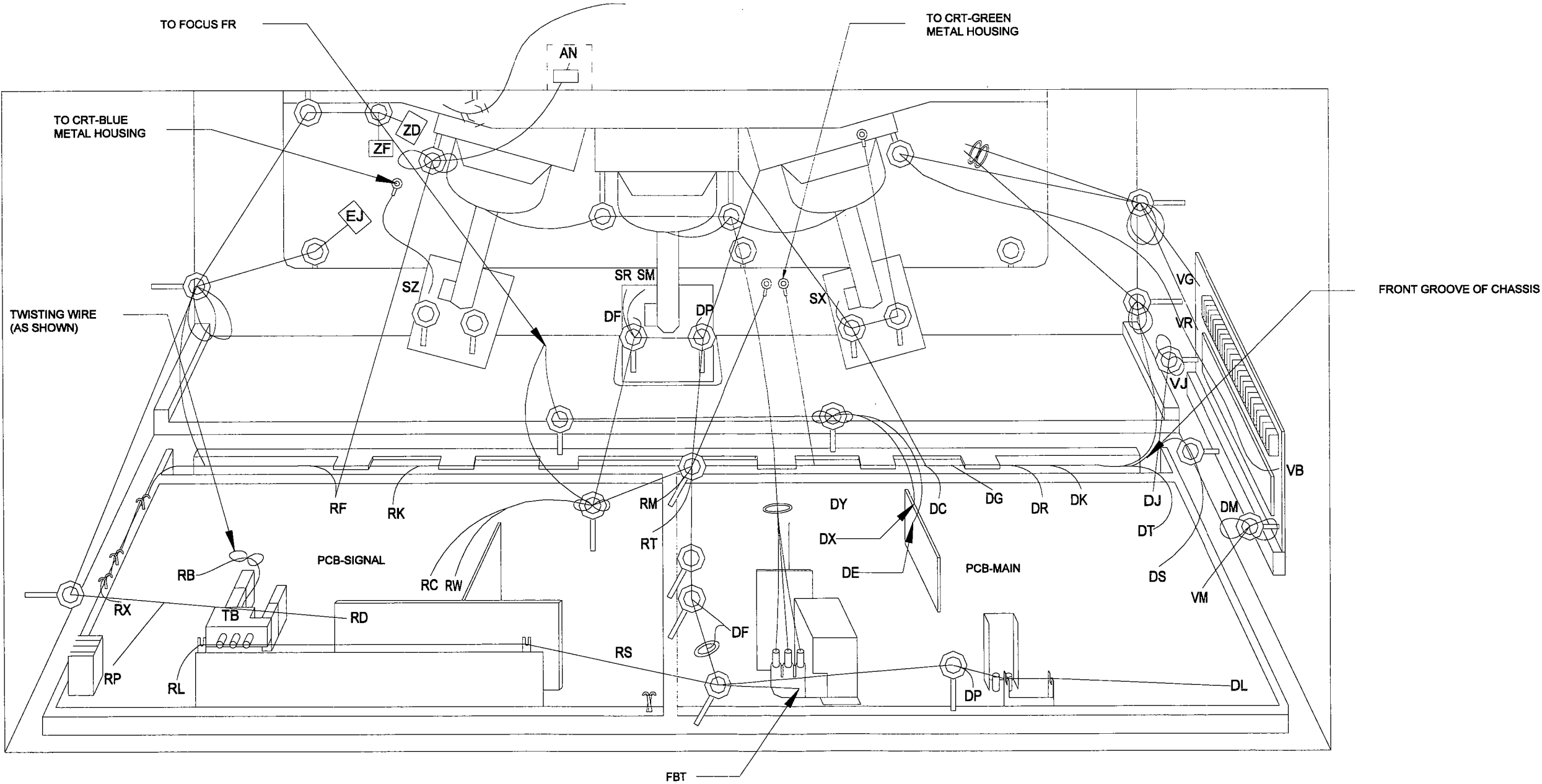
PACKAGING ITEMS



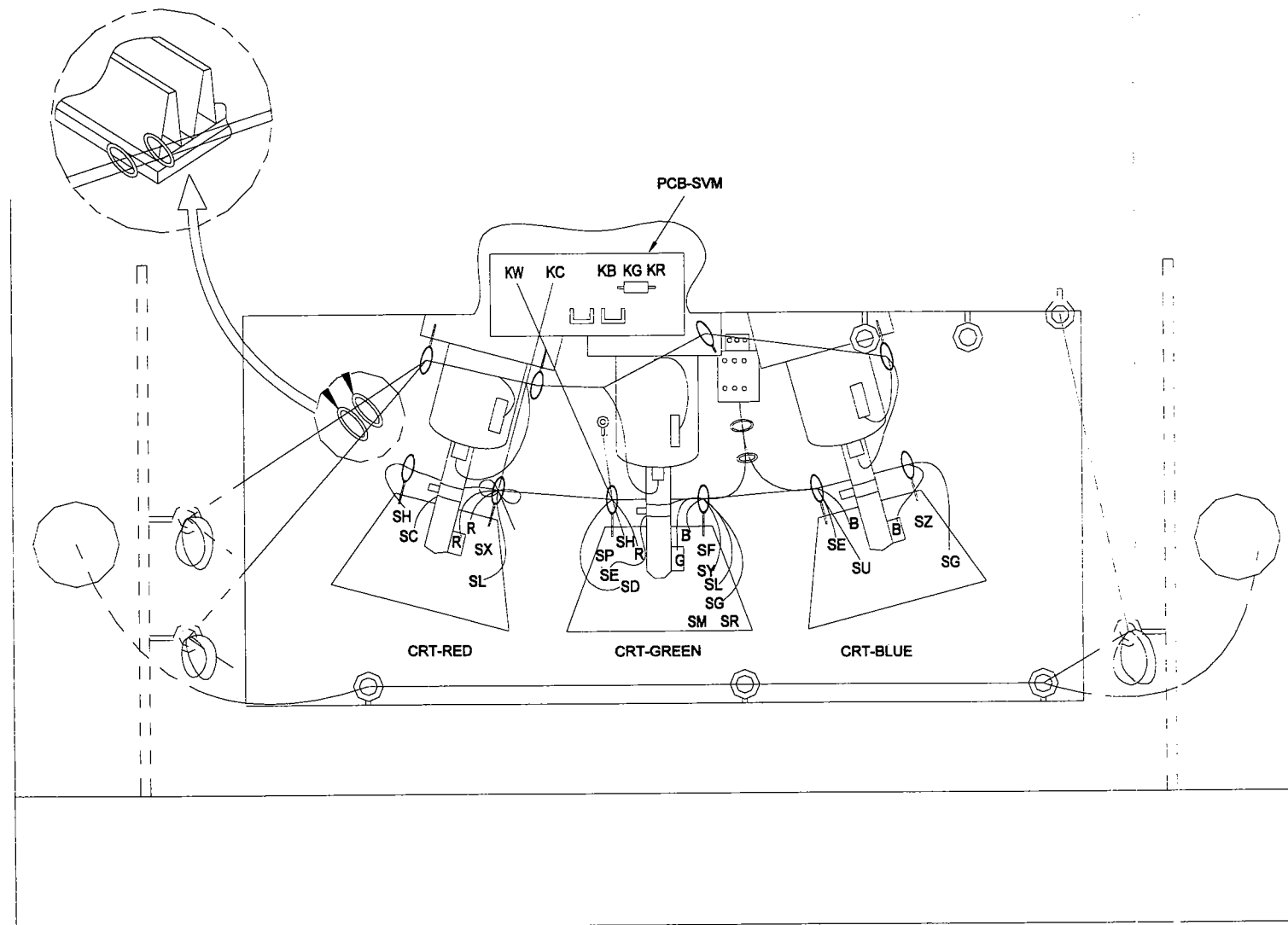
LEAD DRESS

CAUTION: THE INNER WIRES ARE CLAMPED SO THAT THEY DO NOT COME CLOSE TO HEAT GENERATING OR HIGH VOLTAGE PARTS. AFTER SERVICING, ROUTE ALL WIRES IN THEIR ORIGINAL POSITIONS.

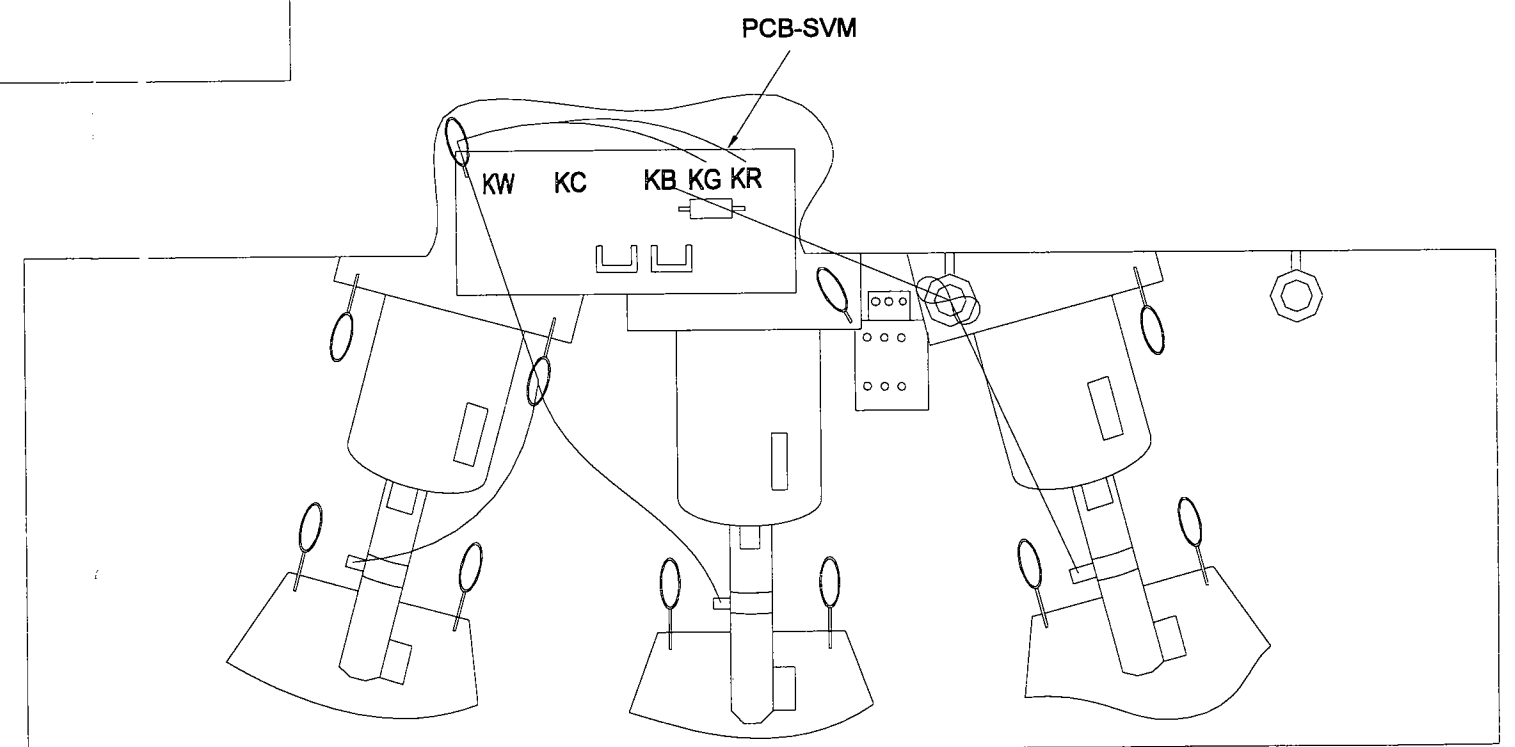
Note: The Anode Lead Wires are routed so that no tension is applied to the Anode Caps. If the routes of the Anode Lead Wires are changed during service, return them to their original positions. Clamp the Lead Wires along the clamping path as shown in the figure below. Insure that the Lead Wires are not slack.



[REAR VIEW]



[FRONT VIEW]

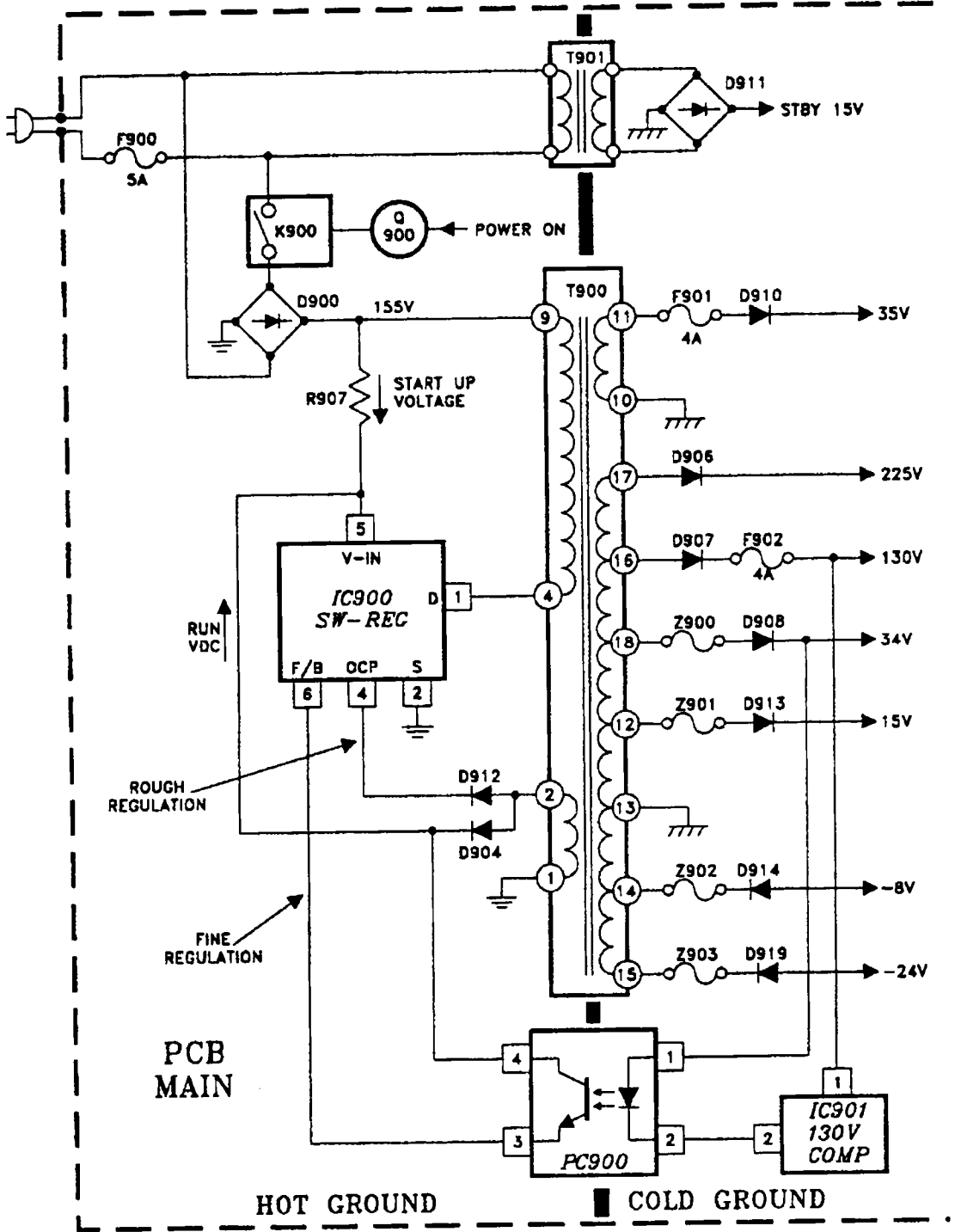
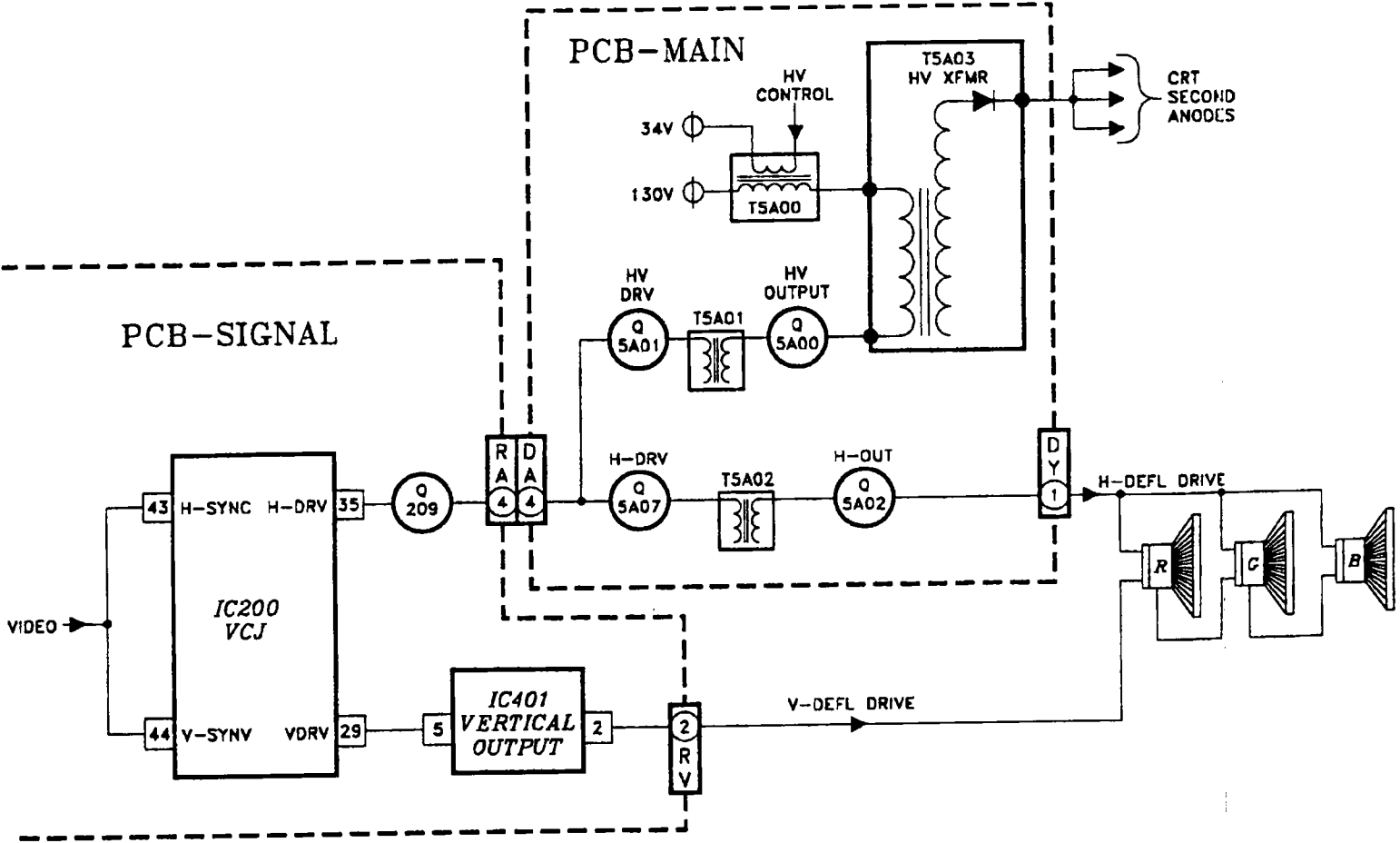


[FRONT VIEW / PCB-SVM]

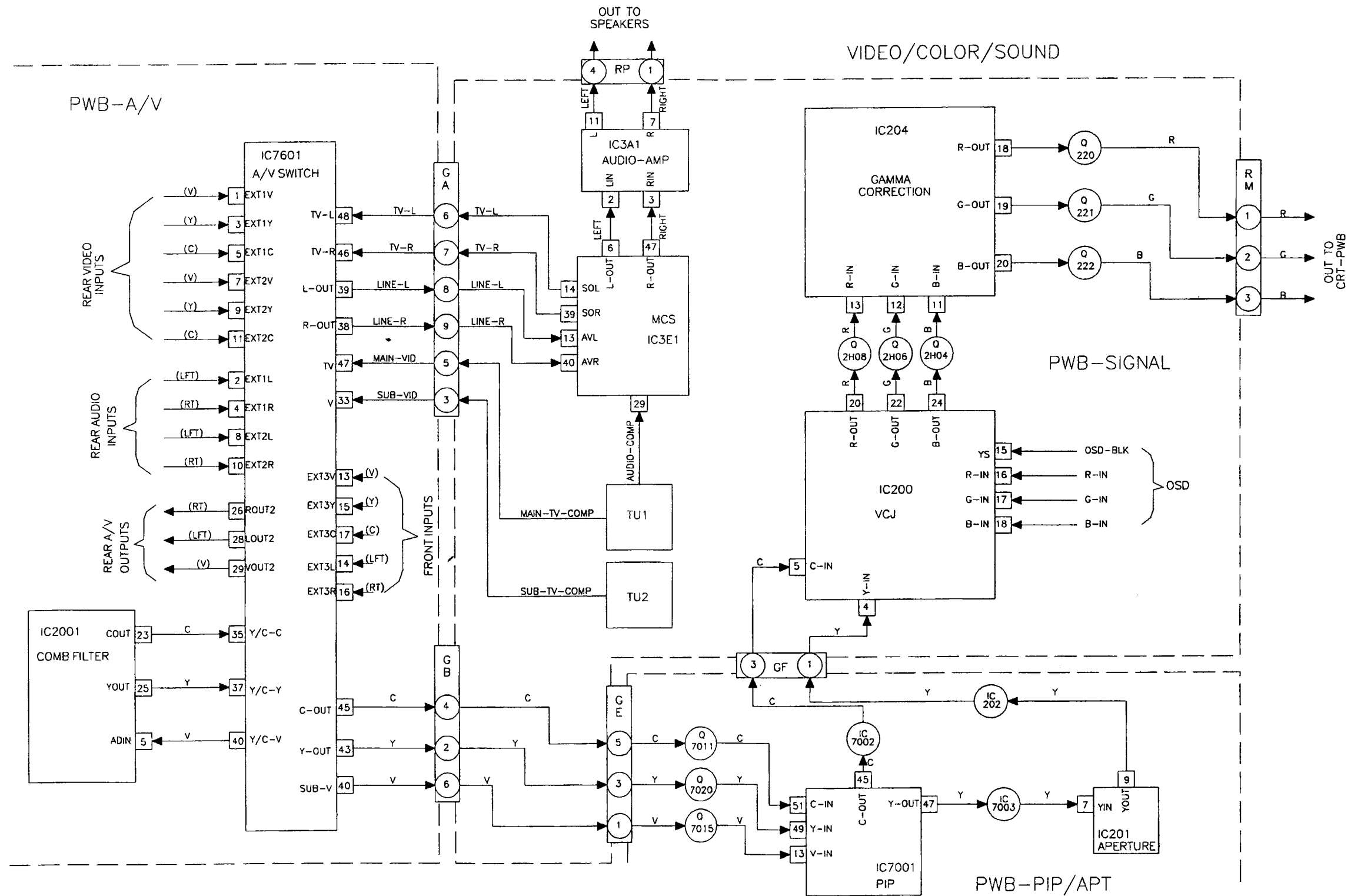
VZ4 CHASSIS BLOCK DIAGRAM

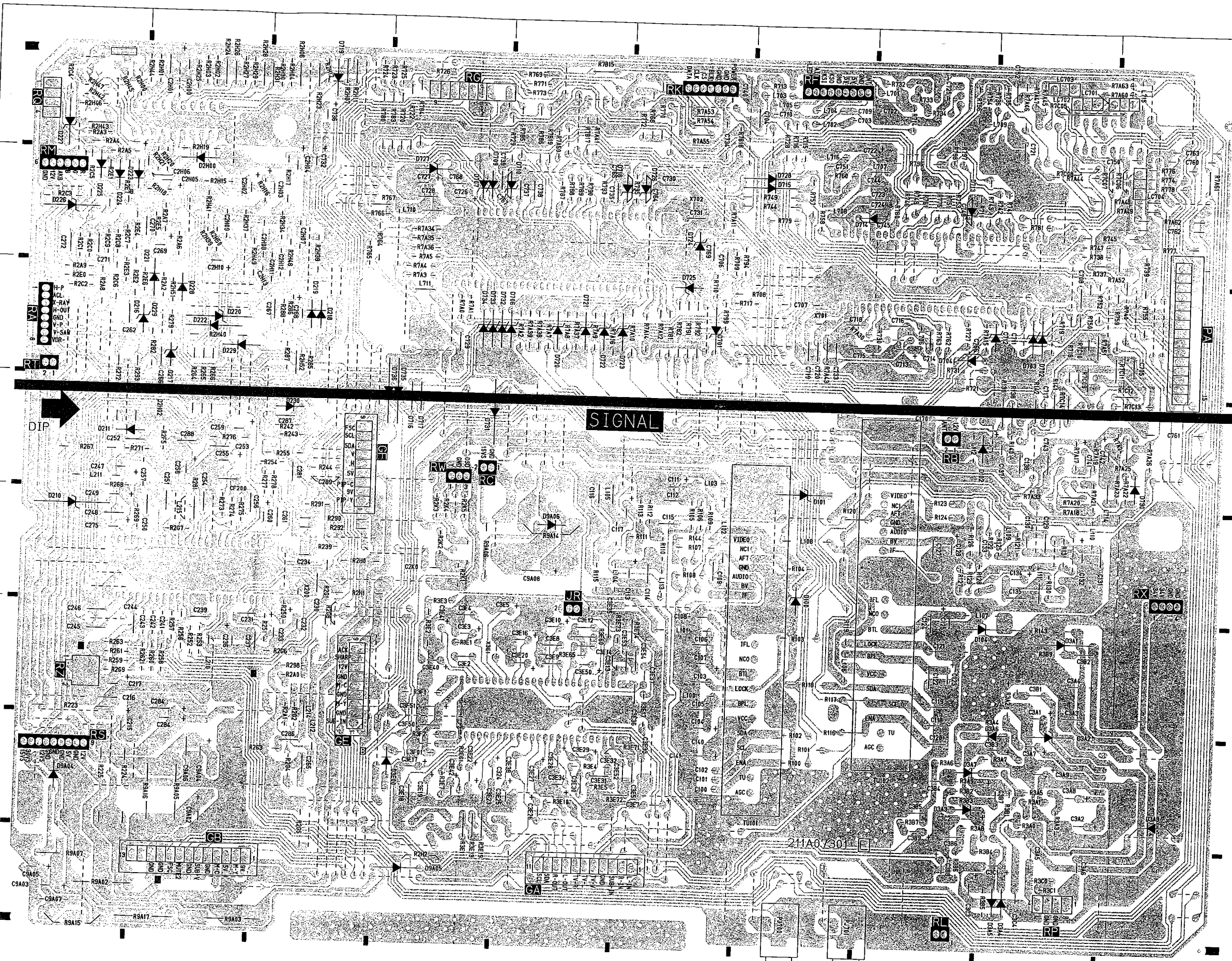
POWER

DEFLECTION



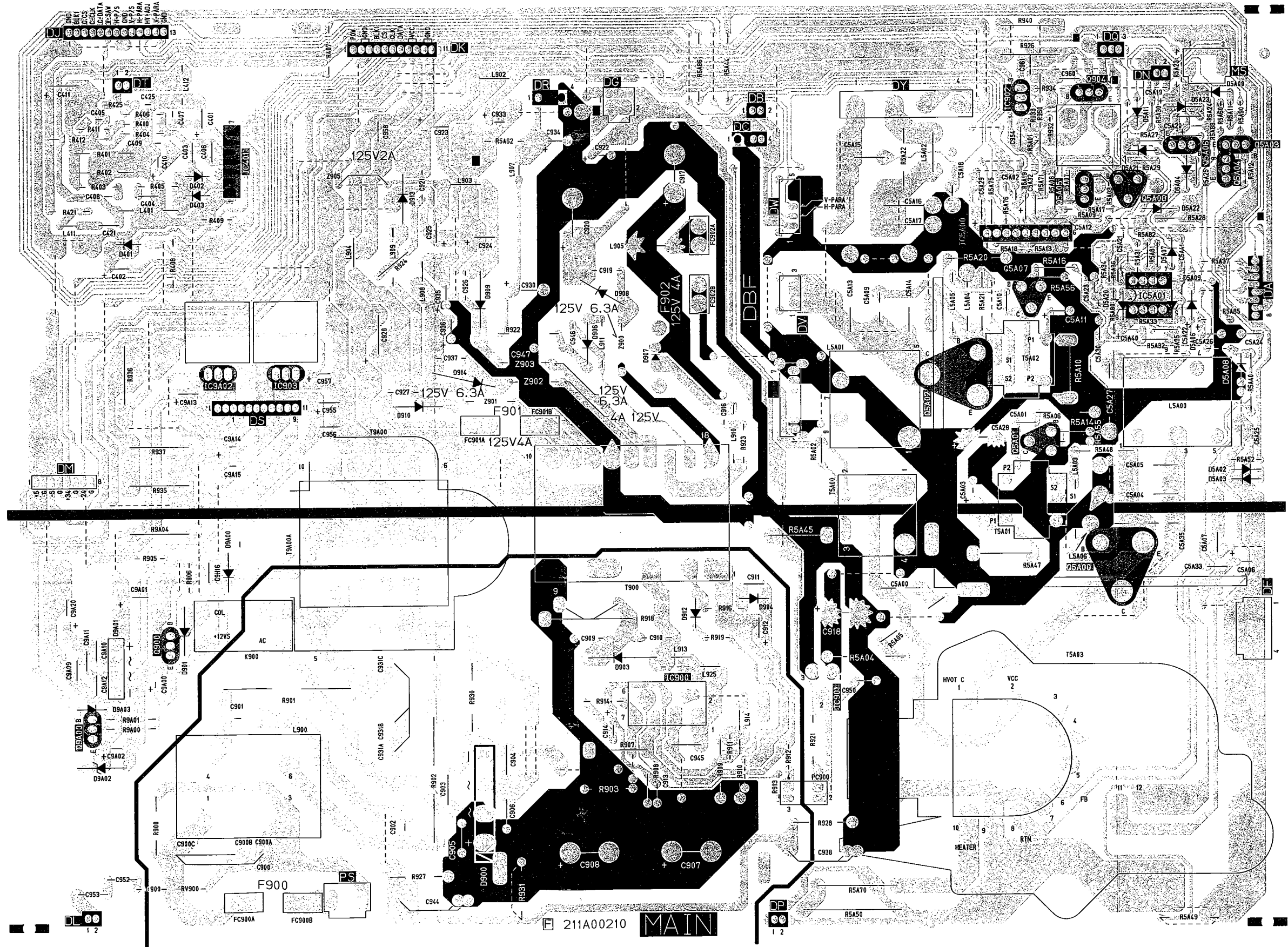
VZ4 CHASSIS SIGNAL PATH DIAGRAM





SIGNAL

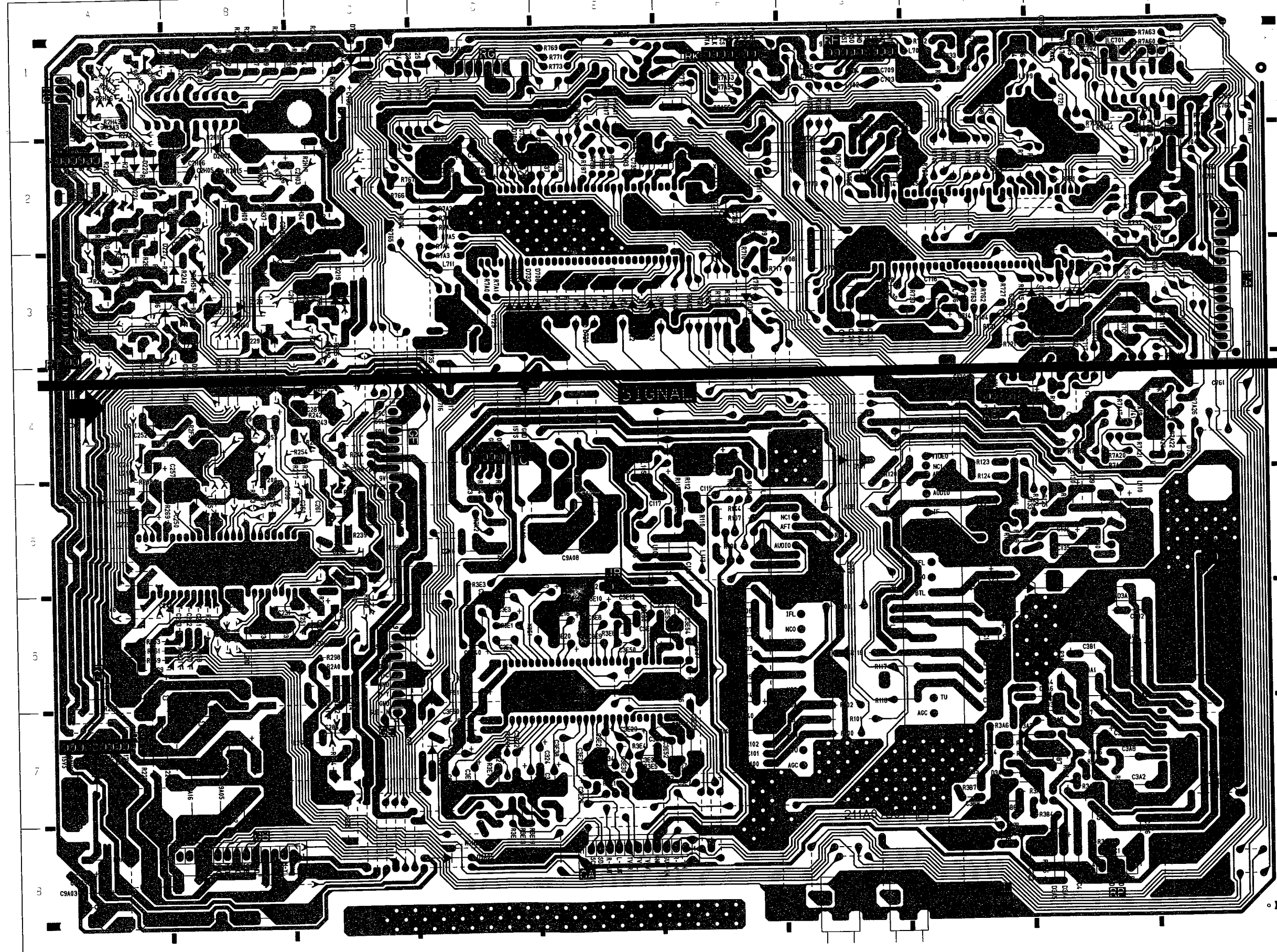
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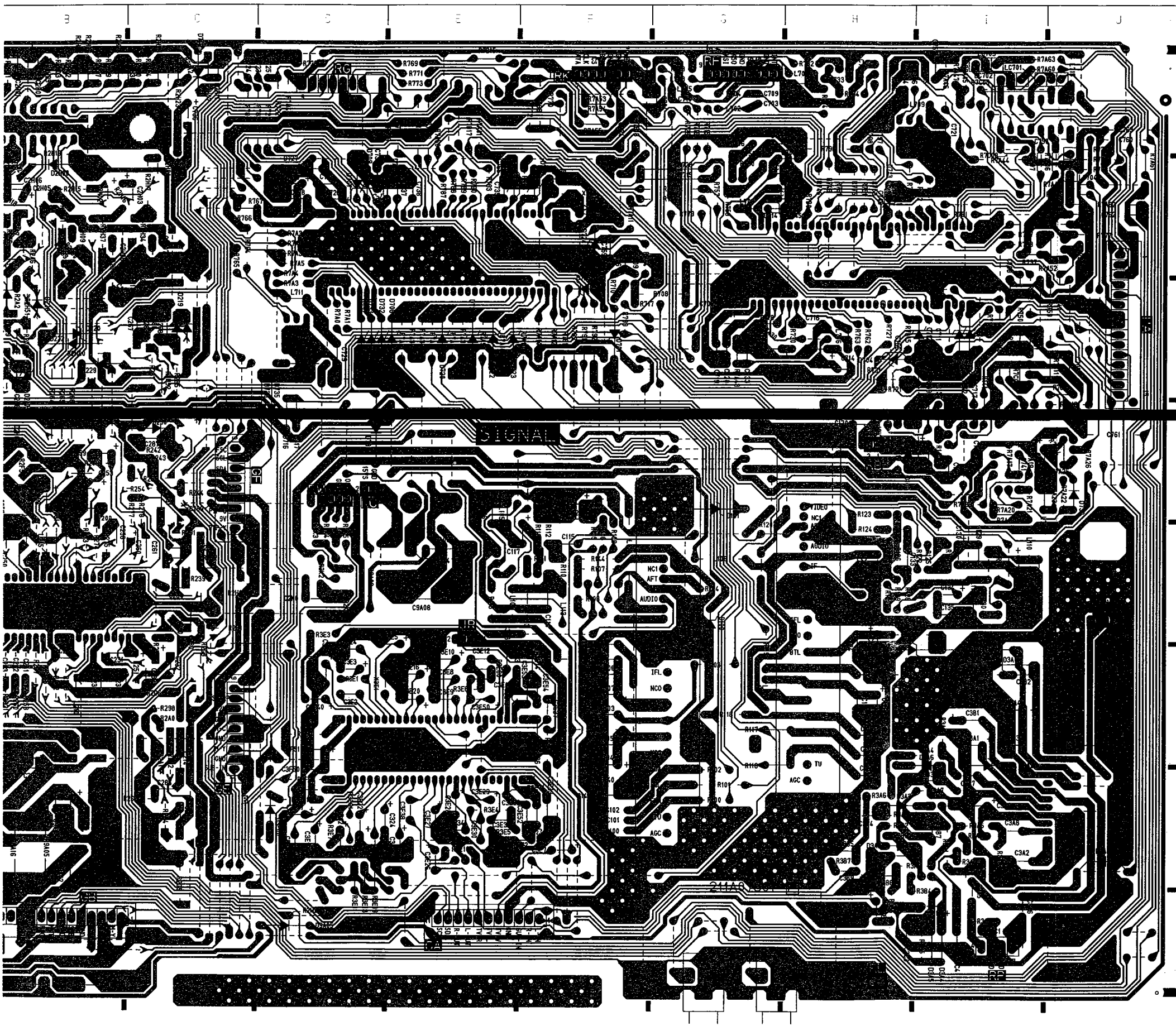
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211A00210

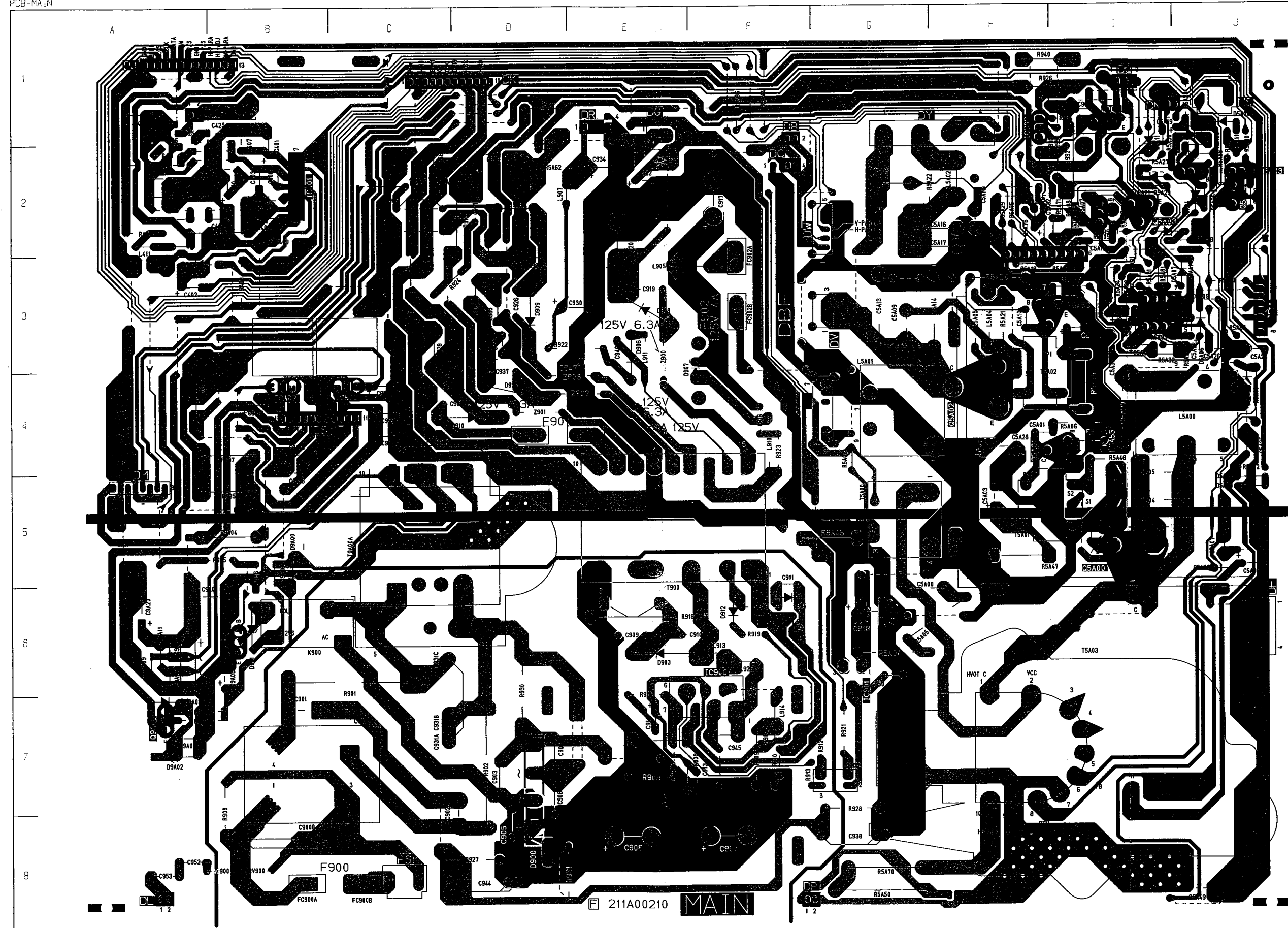
F 211A00210 MAIN



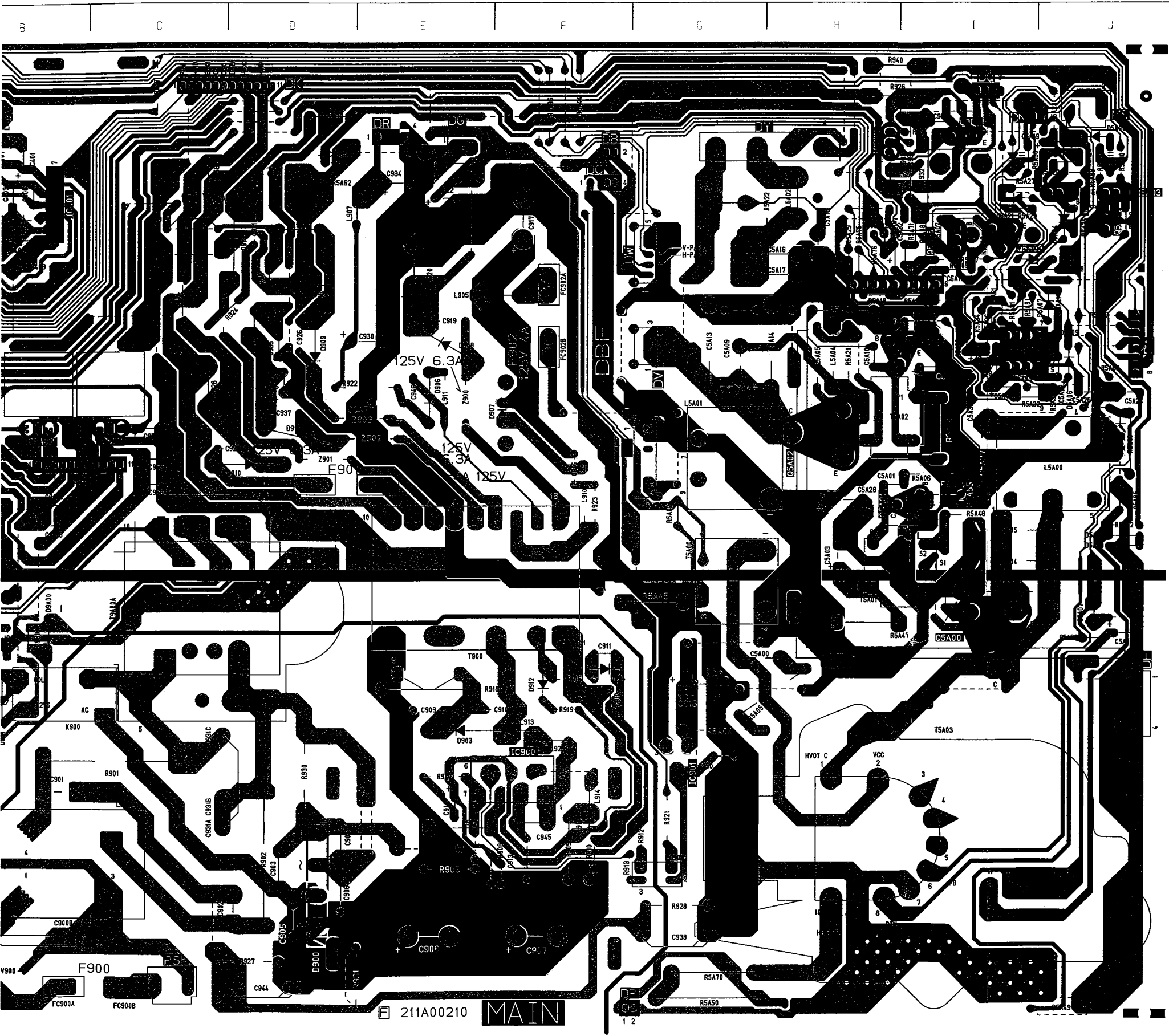
PCB-SIGNAL	
SYMBOLS	
NO.	
C200	B
D100	G
D101	G
D102	H
D104	H
D210	A
D211	A
D216	A
D217	B
D218	C
D219	C
D220	B
D223	A
D224	A
D225	A
D227	A
D228	B
D229	B
D230	C
D2-00	B
D2-02	B
D3A1	T
D3A2	T
D3A3	H
D3A4	
D3A5	
D3A6	
D3A7	
D3A8	
D3E00	
D701	
D702	
D703	
D704	
D706	
D707	
D709	
D710	
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D721	
D722	
D723	
D724	
D725	
D726	
D727	
D728	
D730	
D731	
D732	
D733	
D734	



PCB-SIGNAL		SYMBOL ADDRESS		SYMBOL ADDRESS		SYMBOL ADDRESS		SYMBOL ADDRESS	
SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
CF200	B-4	D735	D-3	PJ701	G-8	TP11	F-5		
		D736	D-3			TP11A	H-5		
D100	G-5	D9A04	A-7	Q100	F-5				
D101	G-4	D9A05	D-8	Q101	F-5	TU101	G-5		
D102	H-4	D9A06	E-5	Q102	F-5	TU102	H-5		
D104	H-6			Q102	E-5				
D210	A-5	IC200	B-5	Q103	E-5	X200	C-5		
D211	A-4	IC203	B-6	Q104	H-5	X3E1	D-6		
D216	A-3	IC204	B-1	Q105	H-4	X701	G-3		
D217	B-3	IC3A1	I-7	Q106	I-5	X702	F-2		
D218	C-3	IC3E1	E-6	Q107	I-5				
D219	C-3	IC700	H-2	Q109	H-4				
D220	B-3	IC701	D-3	Q110	I-4				
D223	A-2	IC702	G-2	Q206	C-4				
D224	A-2	IC703	E-2	Q209	A-3				
D225	A-2	IC705	I-1	Q210	C-5				
D227	A-1	IC706	H-1	Q211	C-6				
D228	B-3	IC9A00	B-7	Q212	C-6				
D229	B-3	IC9A01	A-7	Q213	C-4				
D230	C-4	IC9A12	E-4	Q214	C-3				
D2H00	B-2			Q215	C-3				
D2H02	B-4	L100	F-6	Q216	B-3				
D3A1	I-6	L101	F-6	Q217	B-2				
D3A2	I-6	L102	F-5	Q220	A-2				
D3A3	H-7	L103	F-4	Q221	A-2				
D3A4	I-8	L104	E-5	Q222	A-2				
D3A5	I-8	L105	E-4	Q224	C-5				
D3A6	I-6	L106	G-6	Q225	C-7				
D3A7	H-7	L107	H-5	Q2H04	B-2				
D3A8	J-7	L108	G-5	Q2H05	C-2				
D3E00	D-7	L109	I-5	Q2H06	B-2				
D701	F-3	L110	I-5	Q2H07	B-2				
D702	I-3	L111	I-5	Q2H08	B-2				
D703	I-3	L112	H-4	Q2H09	B-2				
D704	H-3	L113	F-5	Q2H10	A-1				
D706	E-3	L210	B-6	Q2H11	A-1				
D707	D-2	L211	A-4	Q2H12	A-1				
D709	D-2	L212	C-7	Q2K0	D-5				
D710	D-2	L214	C-6	Q314	I-7				
D713	H-2	L215	B-5	Q3A1	I-7				
D714	G-2	L701	H-1	Q3A2	H-6				
D715	G-2	L702	G-1	Q3A3	I-7				
D716	D-4	L703	G-1	Q3E01	E-7				
D717	D-4	L704	G-1	Q3E02	D-7				
D718	E-2	L705	G-1	Q3E03	D-7				
D719	C-1	L706	H-3	Q701	F-3				
D720	E-3	L707	G-2	Q705	H-1				
D721	E-3	L708	G-2	Q706	H-1				
D722	E-3	L709	H-1	Q708	J-2				
D723	E-3	L710	D-2	Q709	E-1				
D724	F-2	L711	D-3	Q710	E-1				
D725	F-2	L714	I-4	Q711	E-1				
D726	F-3	L715	J-1	Q712	I-4				
D727	D-2	L716	G-1	Q713	I-4				
D728	G-2	LC701	I-1	Q714	J-4				
D730	J-4	LC702	I-1	Q715	I-1				
D731	D-4	LC703	I-1	Q716	I-1				
D732	D-3	LC704	J-2	Q7C00	I-3				
D733	D-3			Q7C01	I-4				
D734	D-3	PJ700	G-8						



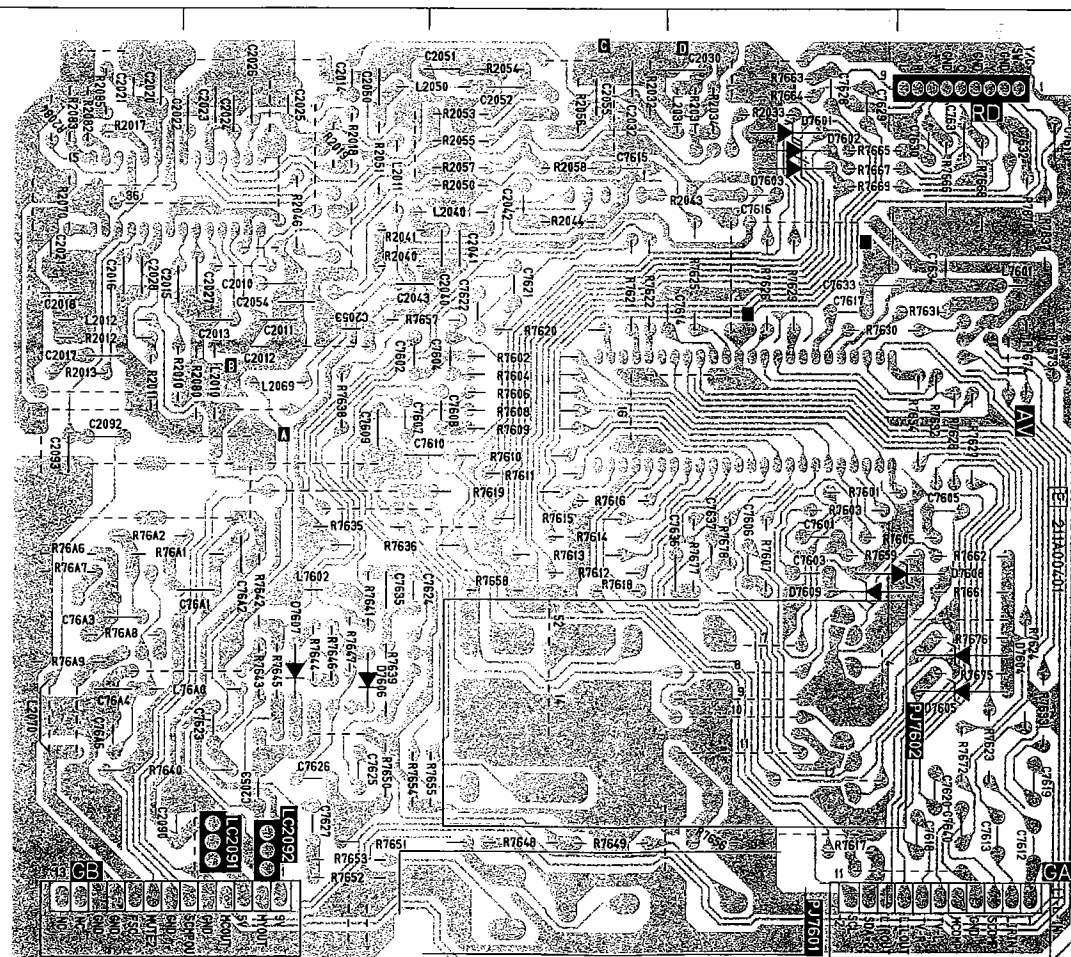
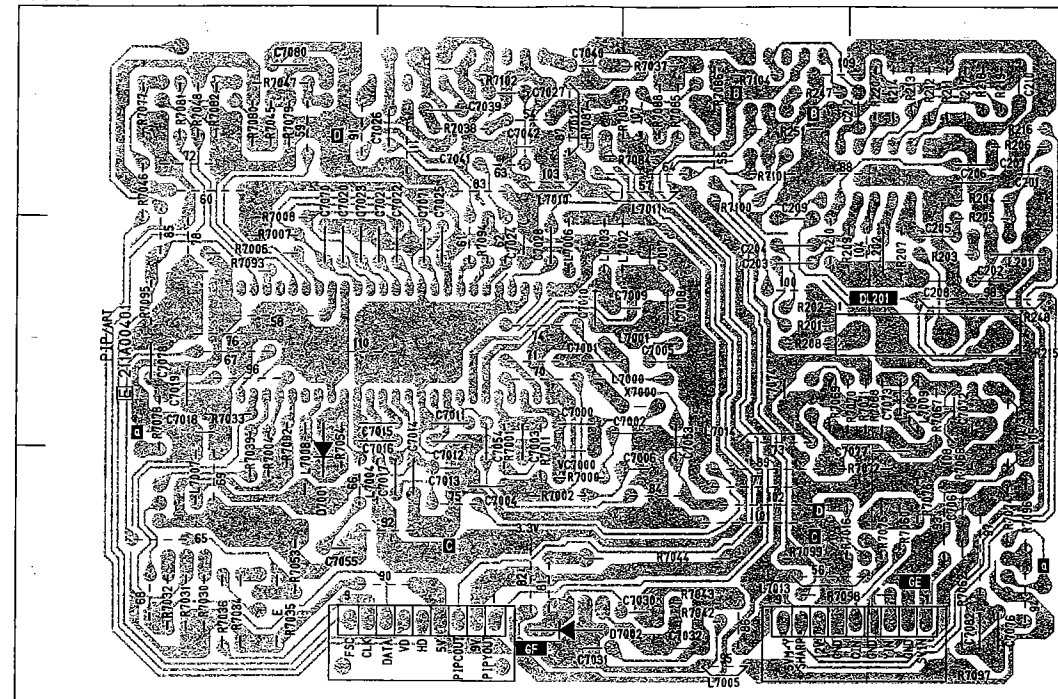
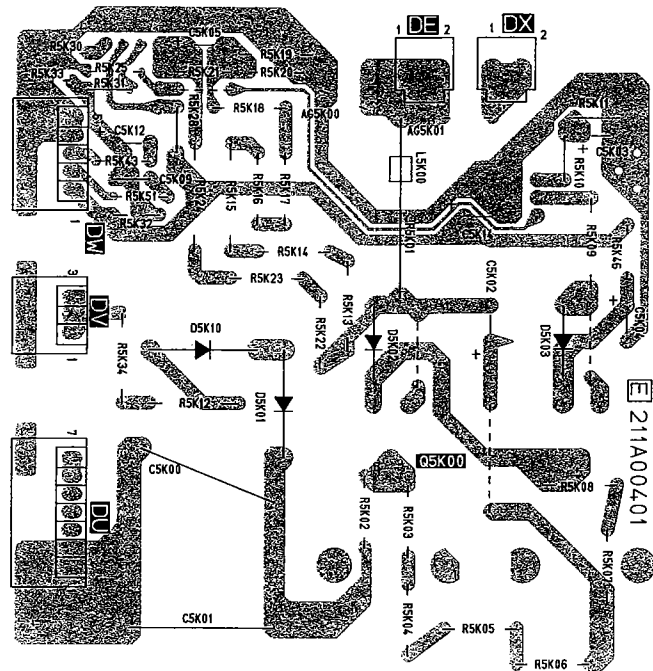
PCB-MAIN	SYMBOL	ADDRESS	5
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	D402	B-2	
	D403	B-2	
	D5A00	J-1	
	D5A02	J-4	
	D5A03	J-1	
	D5A04	J-2	
	D5A06	J-3	
	D5A07	J-3	
	D5A08	J-4	
	D5A09	J-3	
	D5A11	I-1	
	D5A20	I-3	
	D5A21	I-2	
	D5A22	I-2	
	D5A23	J-1	
	D5A27	I-2	
	D900	D-7	
	D901	B-6	
	D903	E-6	
	D904	F-6	
	D906	E-3	
	D9C7	F-3	
	D908	E-3	
	D909	D-3	
	D910	D-4	
	D912	F-6	
	D913	D-2	
	D914	D-4	
	D9AC0	B-5	
	D9A01	A-6	
	D9AC2	A-7	
	D9A03	A-7	
	F900	B-8	
	F901	D-4	
	F902	F-3	
	FC900A	B-8	
	FC900B	C-8	
	FC901A	D-4	
	FC901B	E-4	
	FC902A	F-3	
	FC902B	F-3	
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	IC5A00	H-3	
	IC5A01	I-3	
	IC900	F-6	
	IC901	H-1	
	IC902	G-6	
	IC903	C-4	
	IC9A02	B-4	
	K900	B-6	
	L401	B-2	
	L411	A-2	



PCB-MAIN

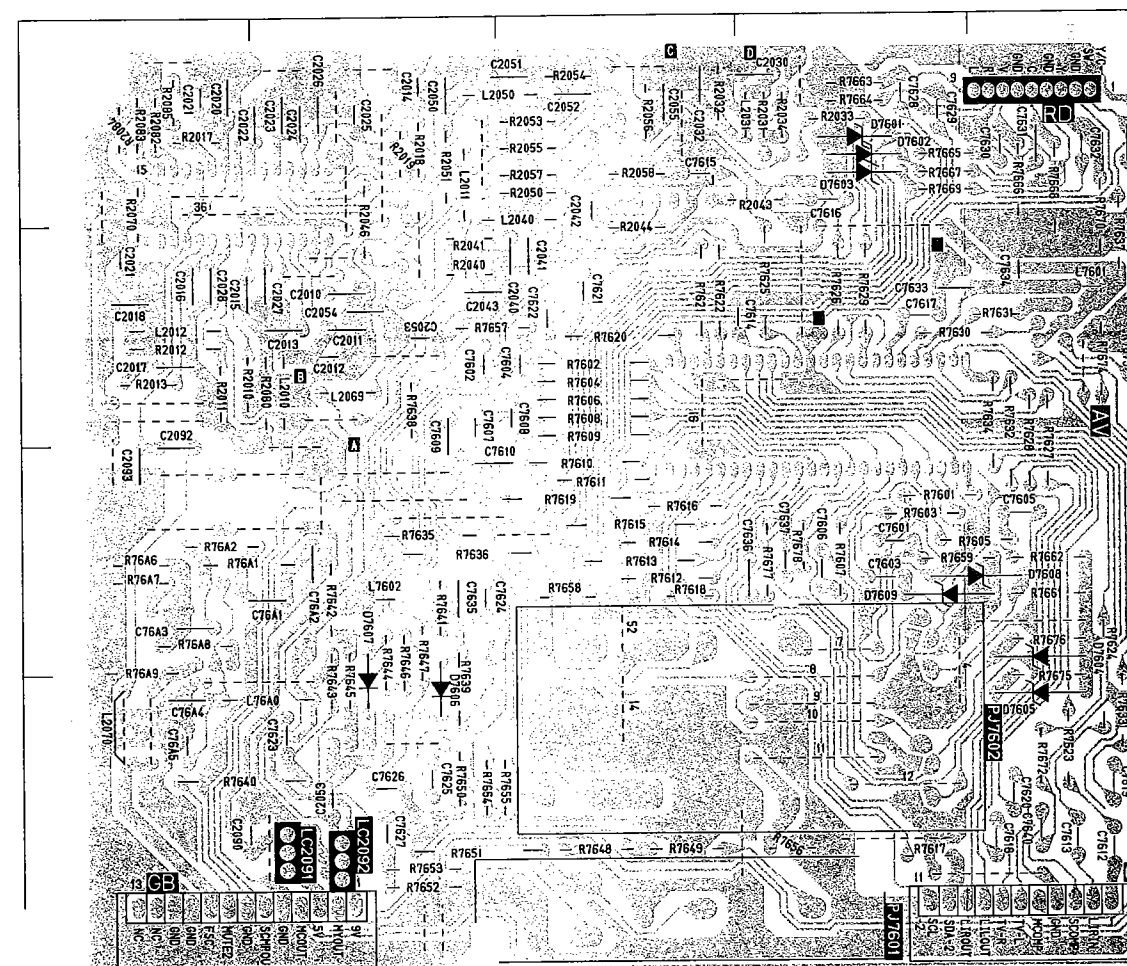
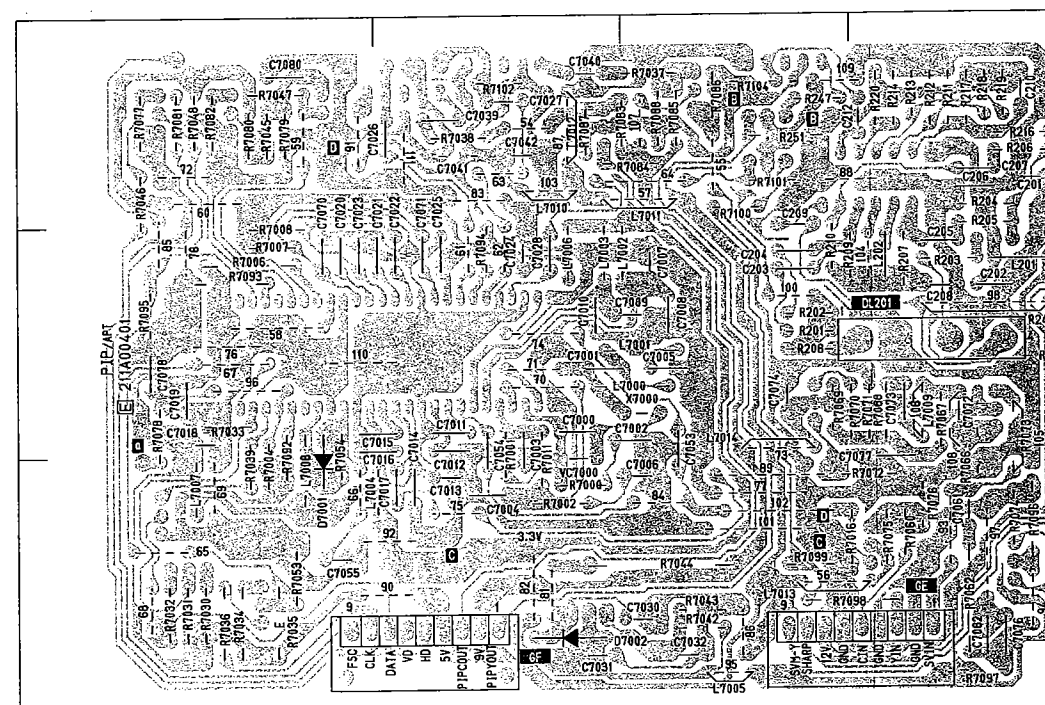
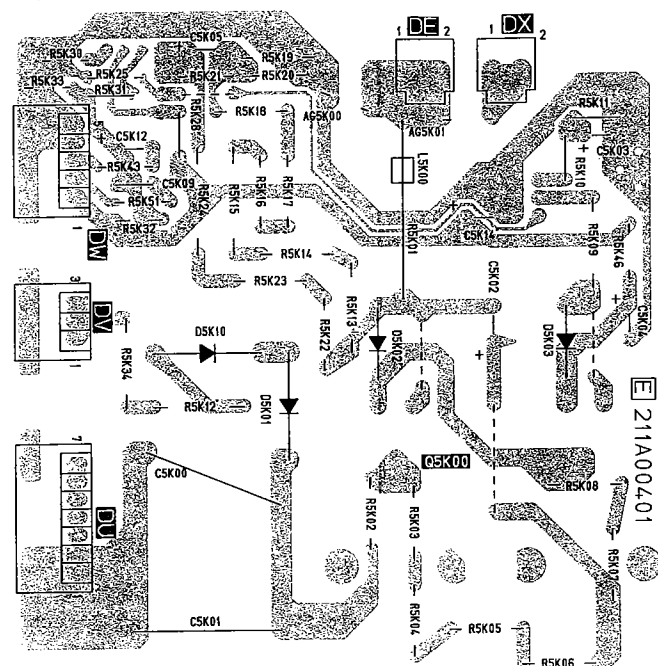
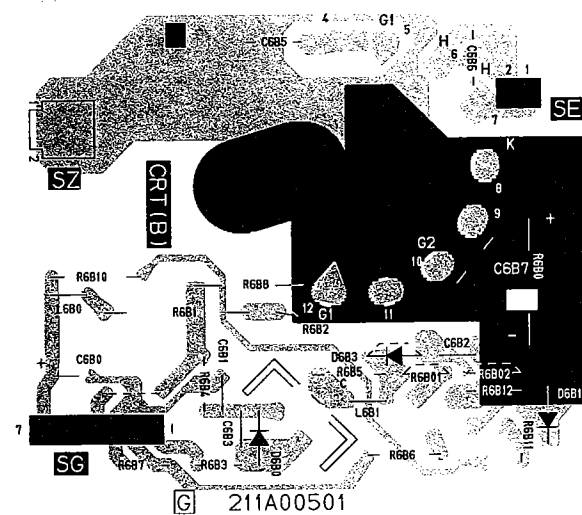
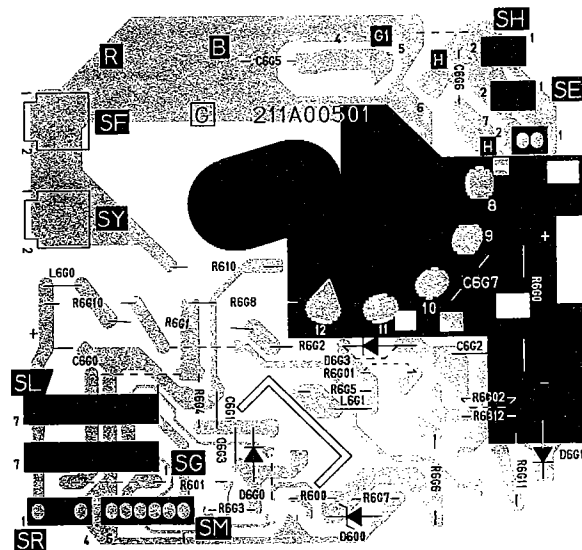
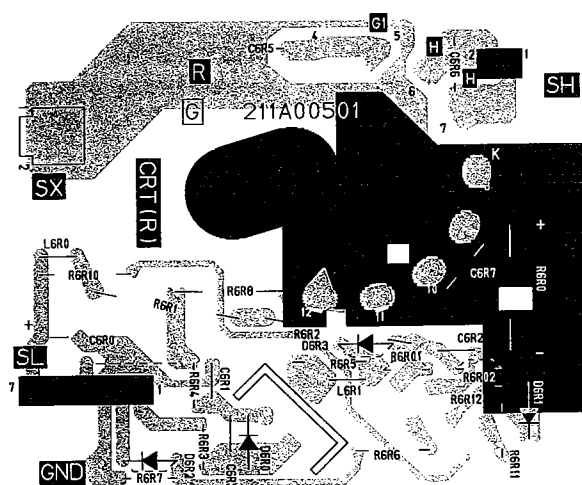
SYMBOL NO.	ADDRESS
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D5A08	J-4
D5A09	J-3
D5A11	I-1
D5A20	I-3
D5A21	I-2
D5A22	I-2
D5A23	J-1
D5A27	I-2
D900	D-7
D901	B-6
D903	E-6
D904	F-6
D906	E-3
D907	F-3
D908	E-3
D909	D-3
D910	D-4
D912	F-6
D913	D-2
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D9A02	A-7
D9A03	A-7
F900	B-8
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FC900B	C-8
FC901A	D-4
FC901B	E-4
FC902A	F-3
FC902B	F-3
IC401	B-2
IC5A00	H-3
IC5A01	I-3
IC900	F-6
IC901	H-1
IC902	G-6
IC903	C-4
IC9A02	B-4
K900	B-6
L401	B-2
L411	A-2

SYMBOL NO.	ADDRESS
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L412	B-1
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L5A02	H-2
L5A03	I-5
L5A05	H-3
L5A06	I-5
L900	B-6
L902	D-1
L903	D-2
L904	C-3
L905	F-3
L907	D-2
L908	D-3
L909	C-3
L910	F-4
L911	E-3
L913	F-6
L914	F-7
L925	F-6
PC900	G-7
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Q5A02	H-4
Q5A03	J-2
Q5A04	J-2
Q5A05	I-2
Q5A06	J-2
Q5A08	I-2
Q900	B-6
Q904	I-1
Q9A00	A-7
T5A00	G-5
T5A01	H-5
T5A02	H-3
T5A02	H-4
T5A03	H-7
T900	E-5
T900A	C-5
Z900	E-3
Z901	D-4
Z902	E-4
Z903	D-4
Z905	C-2



7600	0-1
7601	0-1
7602	0-1
7603	0-1
7604	0-1
7605	0-1
7606	0-1
7607	0-1
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7794	0-1
7795	0-1
7796	0-1
7797	0-1
7798	0-1
7799	0-1
7800	0-1



SYMBOL NO.	ADDRESS
---------------	---------

07001	A-3
07002	B-3
0L201	D-2

IC201	D-1
IC202	D-1
IC7001	A-2
IC7002	B-1
IC7003	B-1
IC7004	B-3

L201	D-2
L202	D-2
L7000	D-2
L7001	D-2
L7004	B-3
L7005	D-3
L7007	A-3
L7008	A-3
L7009	D-2

Q201	D-1
Q208	C-1
Q7000	D-3
Q7006	A-3
Q7007	A-3
Q7008	A-3
Q7011	D-3
Q7013	A-1
Q7014	A-1
Q7015	D-3
Q7016	C-1
Q7017	C-
Q7018	B-
Q7019	A-
Q7020	C-

TP61	A-
TP62	B-
TP63	B-
TPGND	A

VC7000	B
--------	---

Y7000	0
-------	---

SYMBOL NO.	ADDRESS
---------------	---------

07601	D-4
07602	D-4
07603	D-4
07604	E-6
07606	B-7
07607	B-7
07608	E-6
07609	D-6

IC2001	A-4
IC2002	C-4
IC7601	D-5

L2010	B-5
L2011	B-4
L2012	A-5
L2031	D-4
L2040	C-4
L2050	B-4
L2069	B-5
L2070	A-7
L7601	E-5
L7602	B-6
L76A0	A-7

LC2091	B-
LC2092	B-

PJ7601	D-
PJ7602	D-

Q2030	D-
Q2040	B-
Q2050	B-
Q2051	C-
Q2052	C-
Q7601	B
Q7602	B
Q7603	B
Q7670	E
Q7671	E
Q76A0	A
Q76A1	A
Q76A2	A

SYMBOL NO.	ADDRESS
------------	---------

D800	A-3
D8C01	C-3
D8C02	C-3

IC800	B-3
IC870	D-3
IC8C00	C-3
IC8D00	A-2
IC8E00	B-2
IC8F00	D-2
IC8G00	C-2
IC8W00	D-1
IC8W01	B-1
IC8W02	A-1

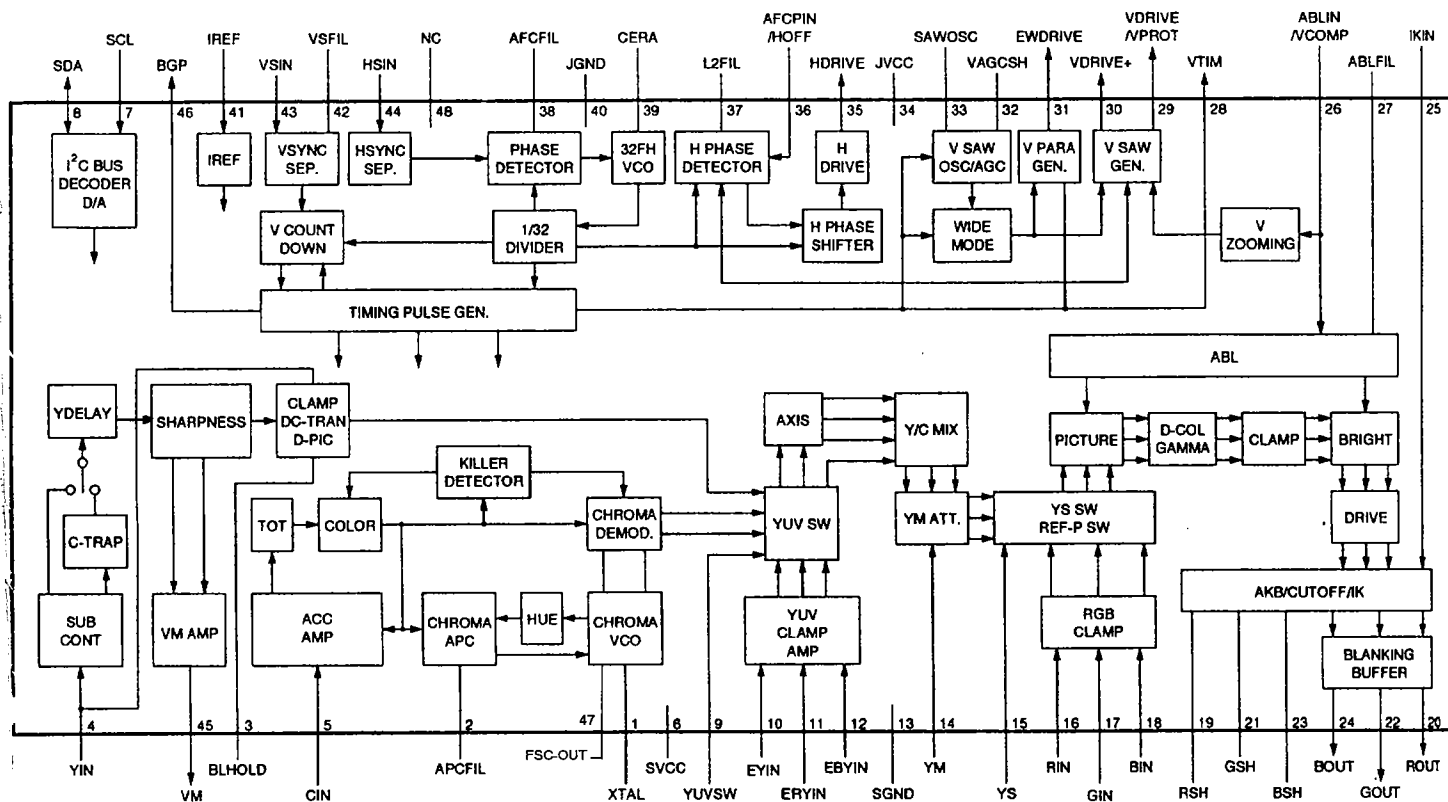
L800	C-3
L802	C-3
L803	C-3
L8001	A-1
L8E01	D-1
L8F01	D-2
L8F02	D-2
L8W01	C-1
L8W02	D-

L8W03	B-
L8W04	B-
L8W05	B-
LW806	A-

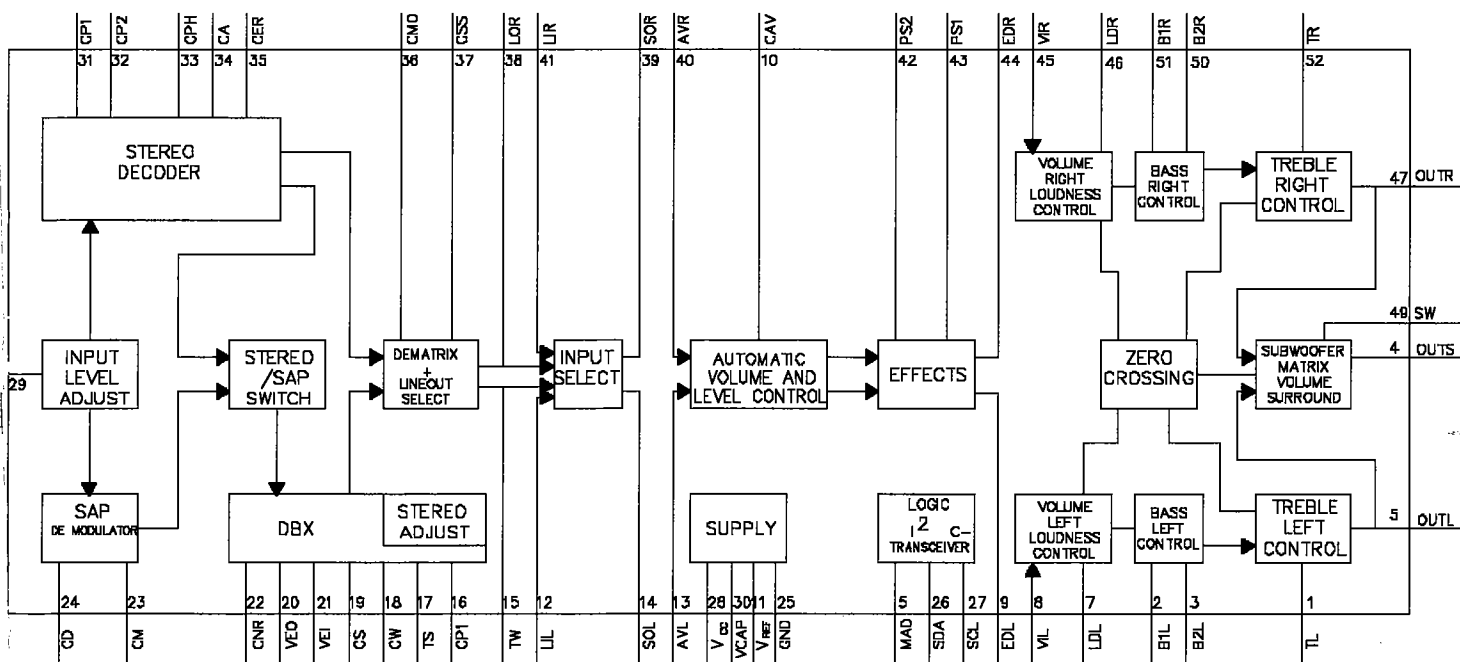
Q800	B-
Q8F00	D-

CB-SIGNAL

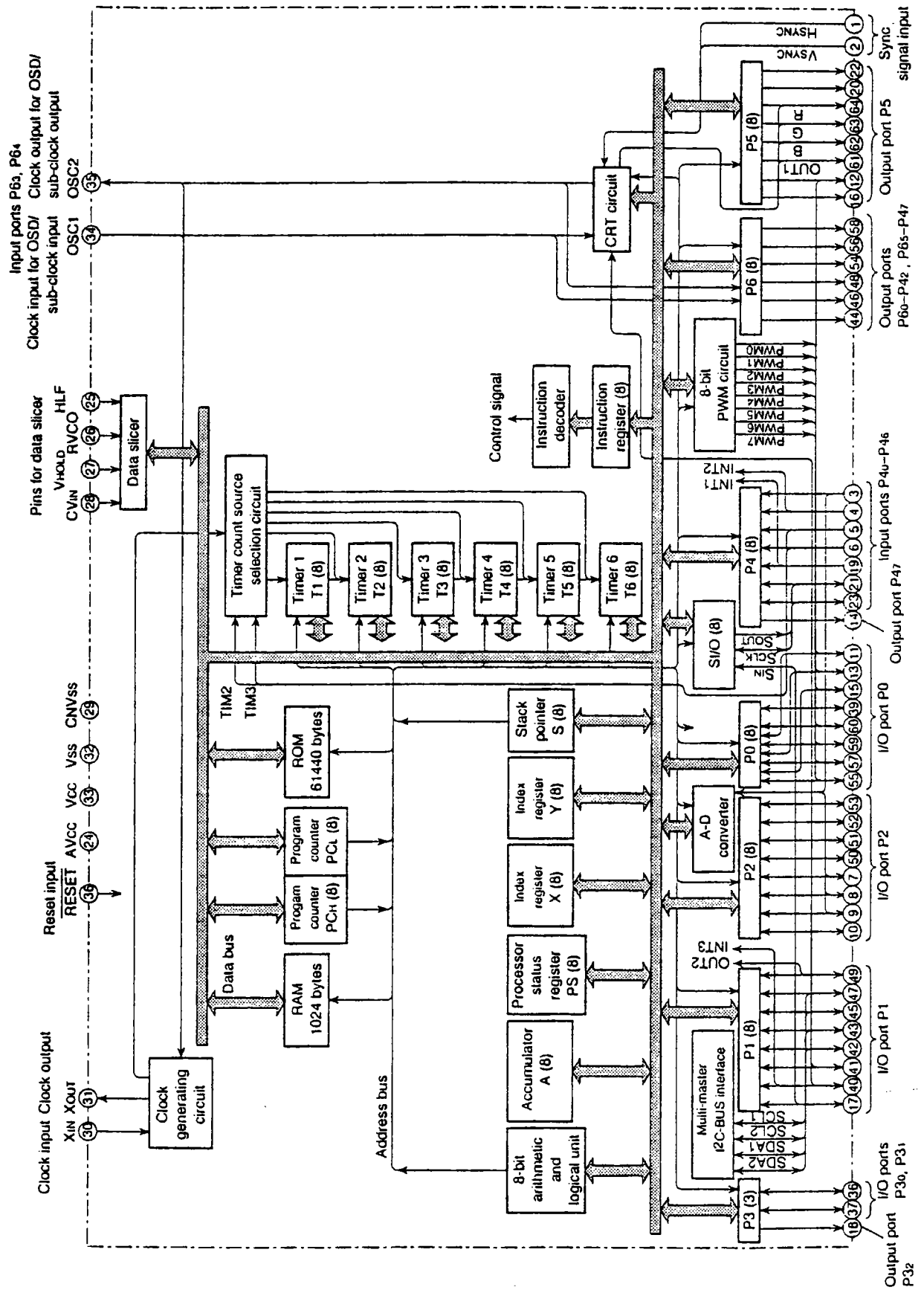
200 CXA2095S



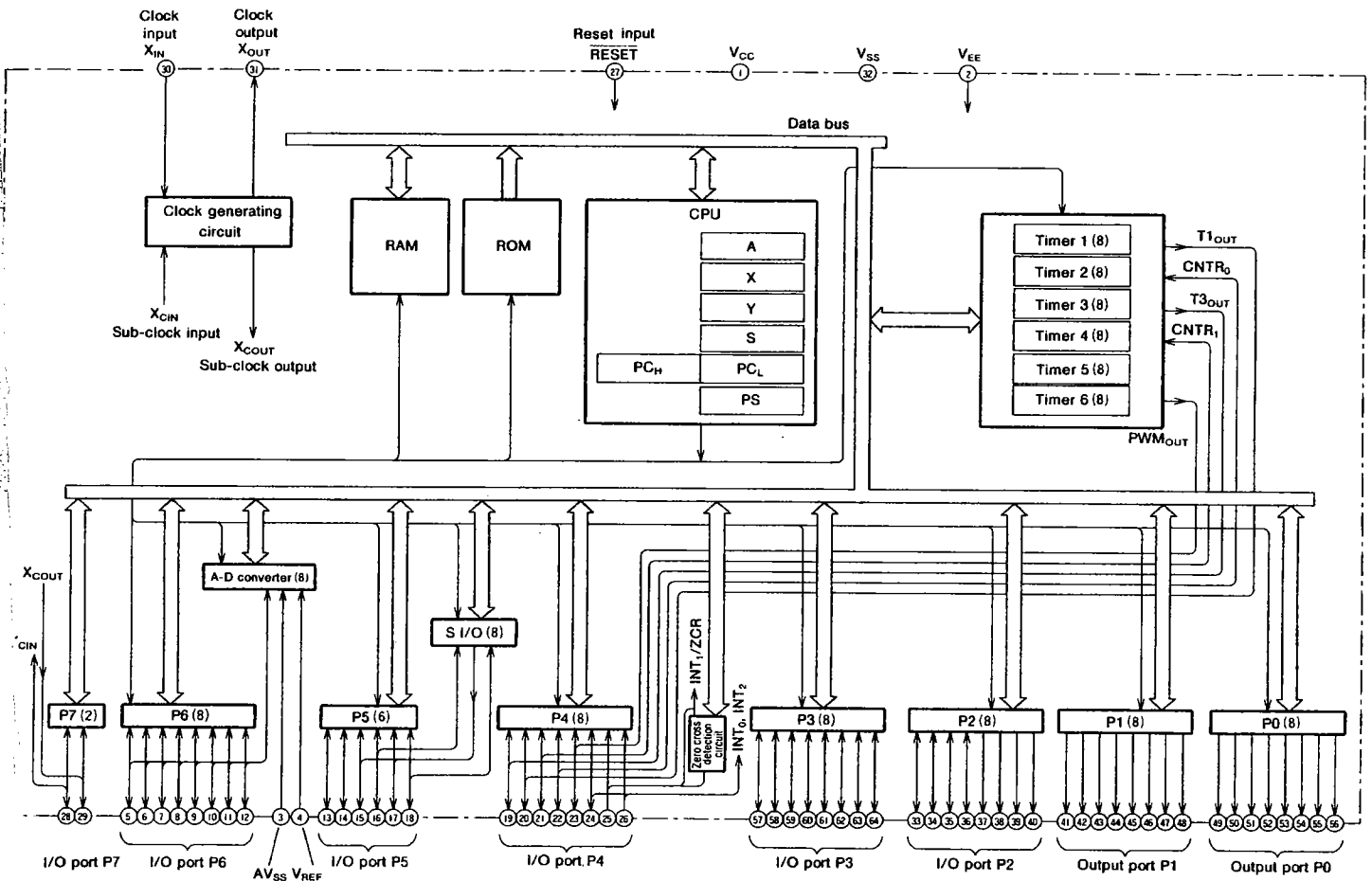
E1 TDA9855



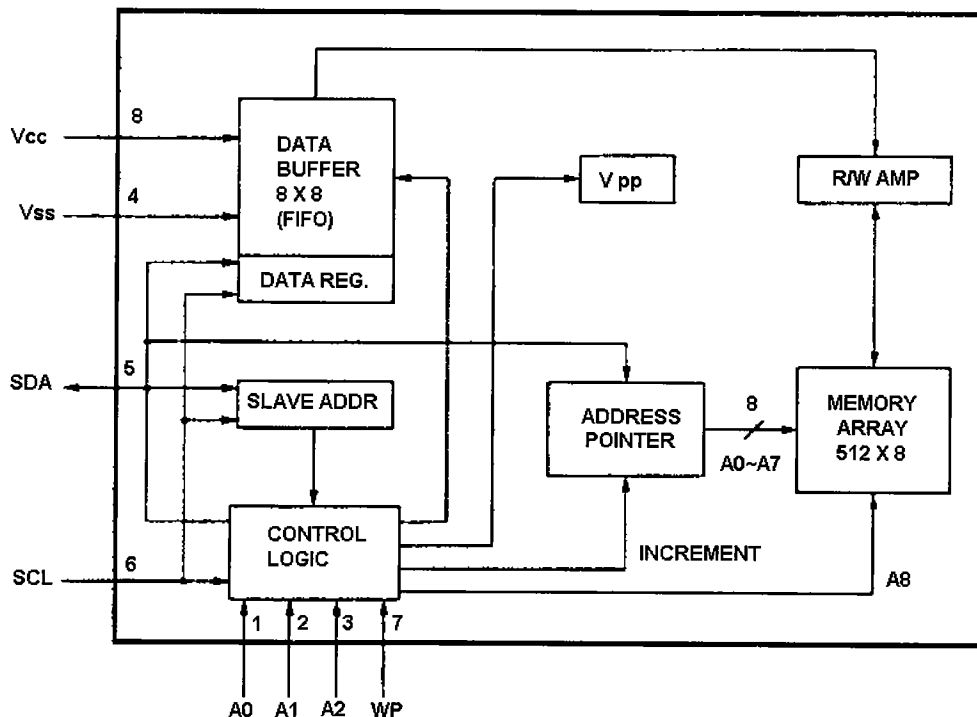
IC700 M37270EFSP



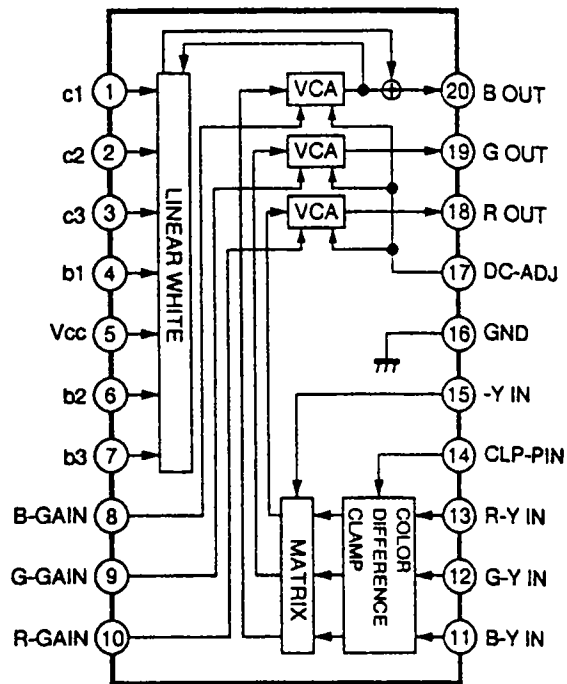
703 M38123E6SP



1 24C04A*P

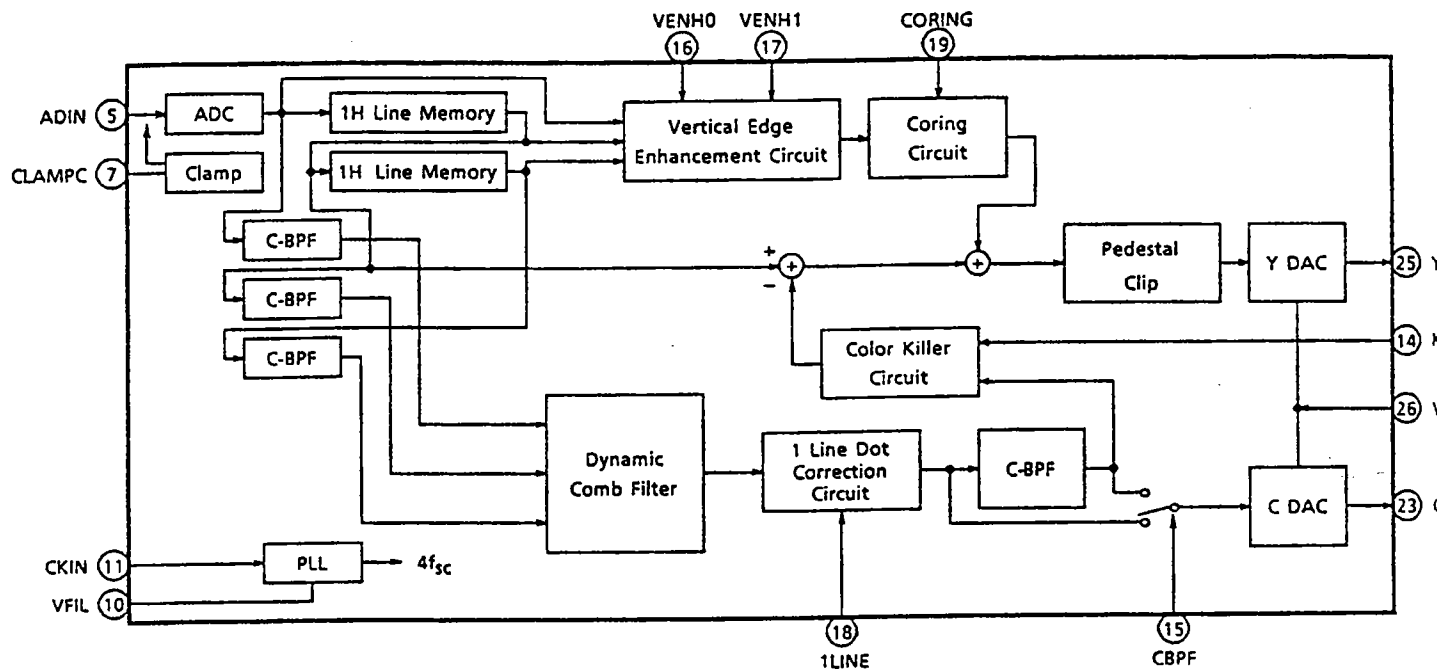


IC204 PA0057A

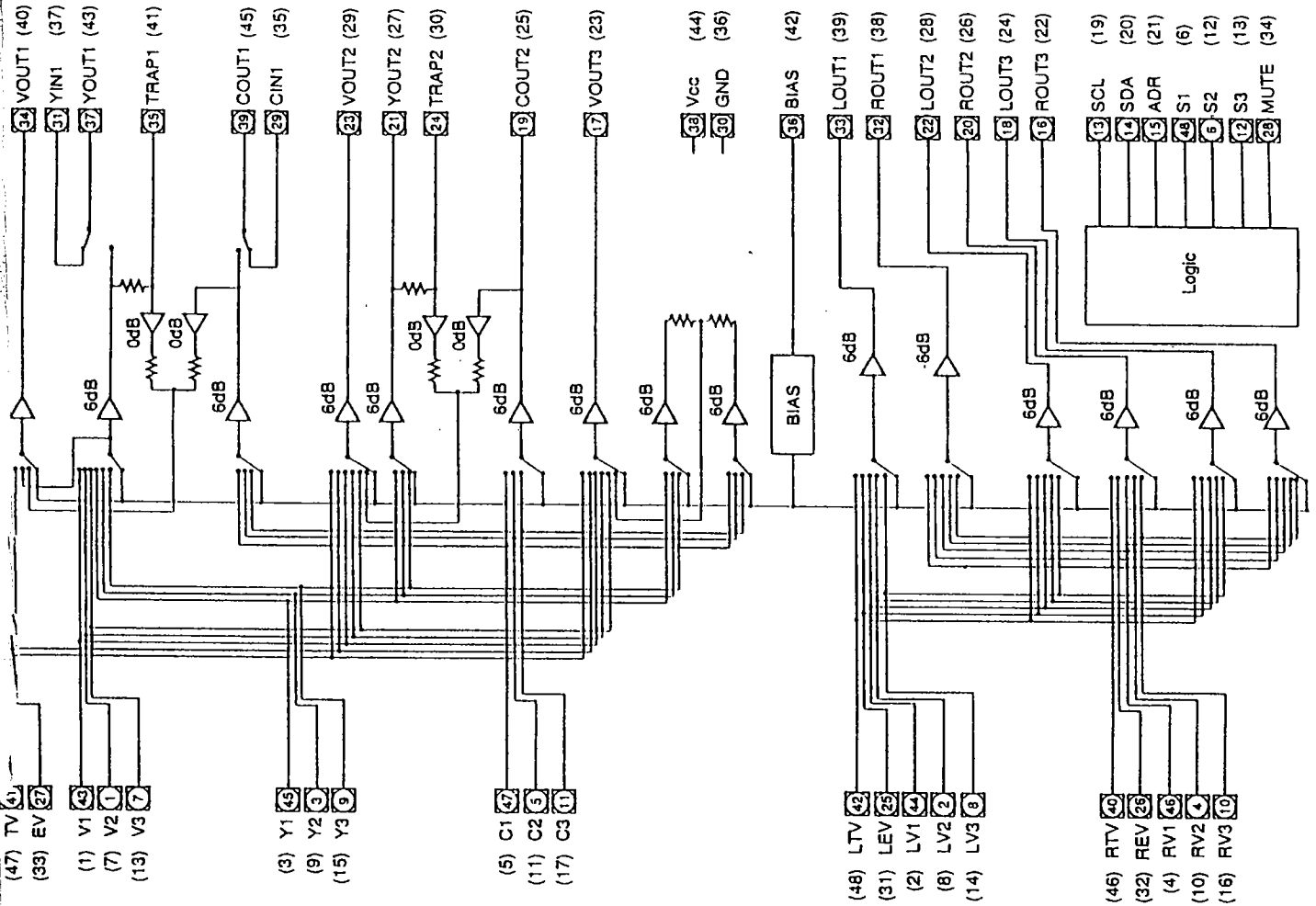


PCB-A/V

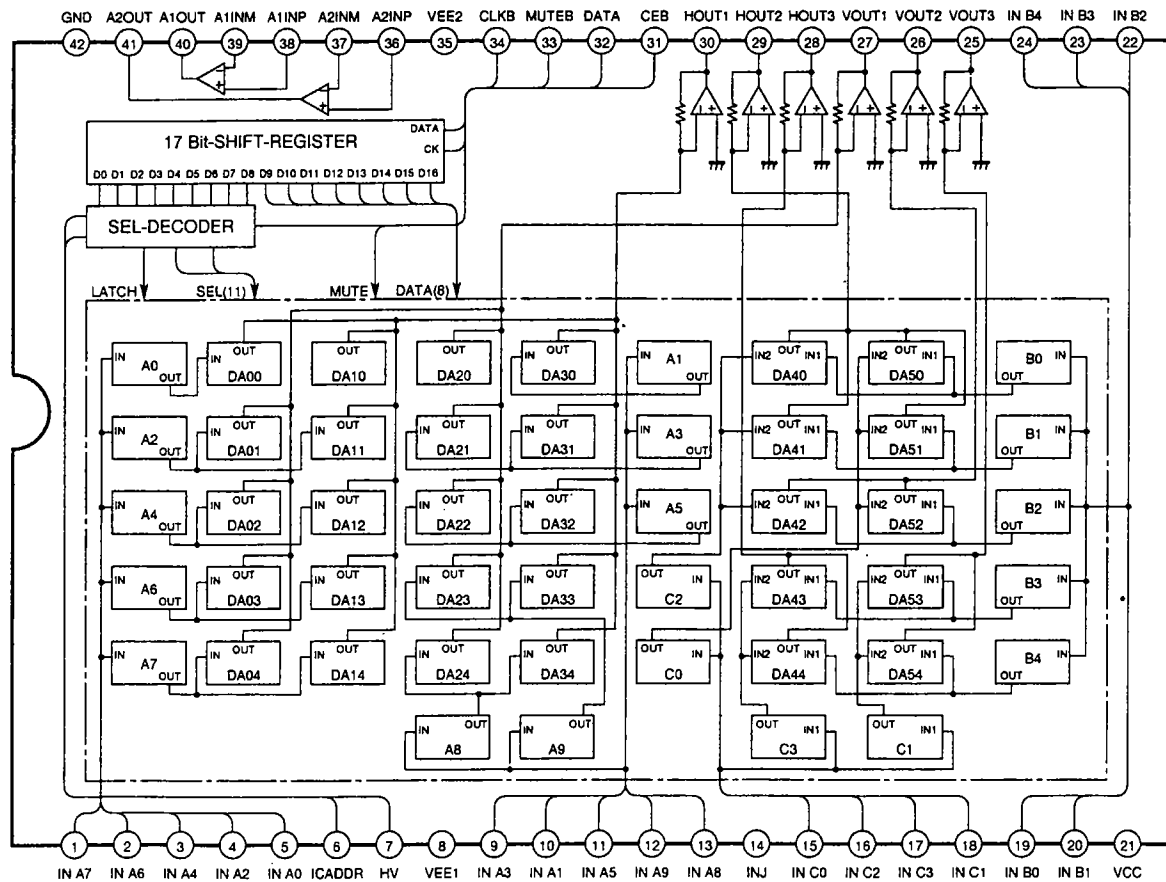
IC2001 T90A13N



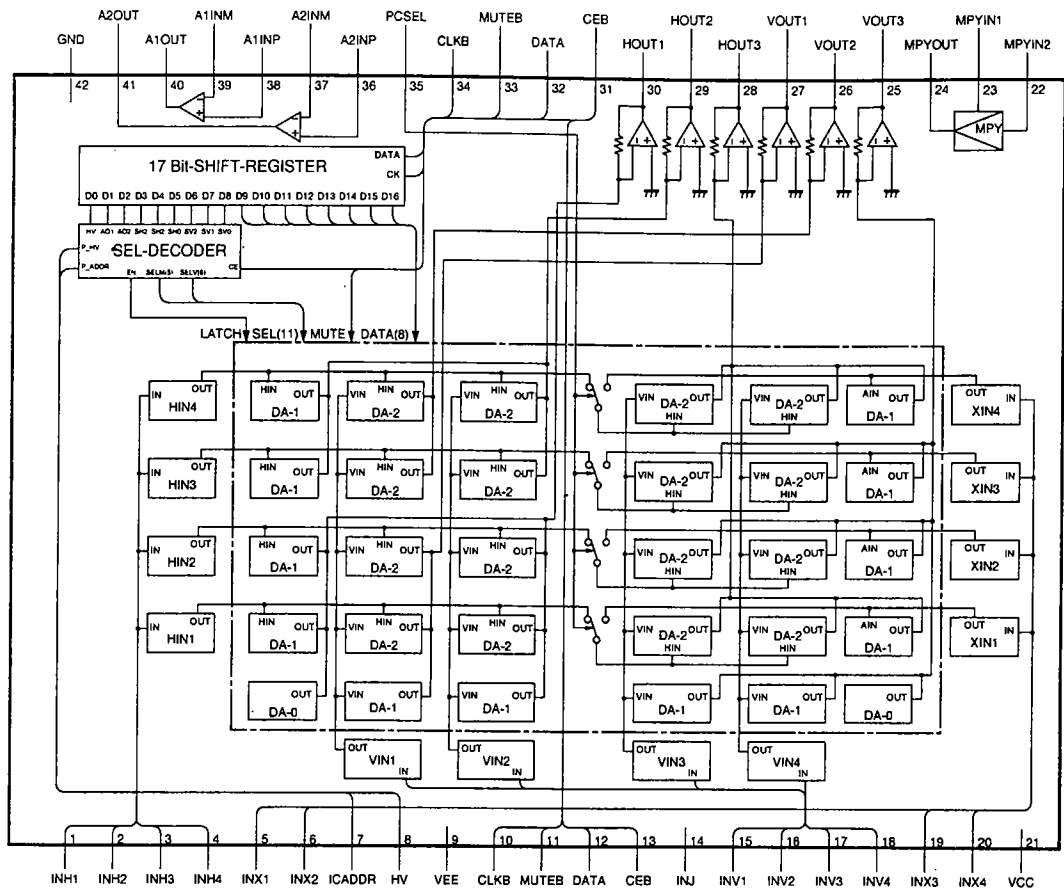
7601 CXA1855S



D00 CM0001AS

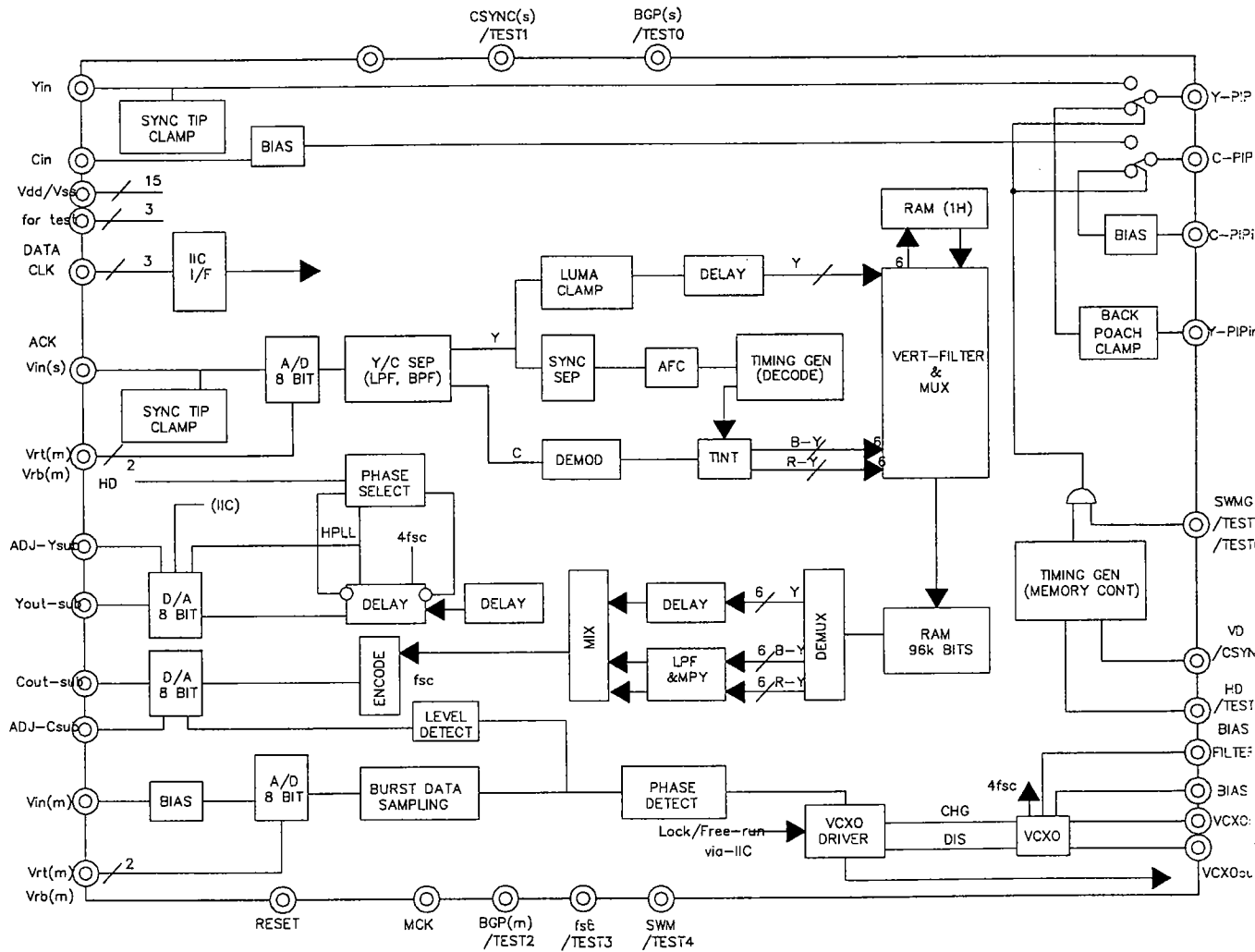


D00 PM0002B



PCB-PIP

IC7001 M65617SP-A



1

2

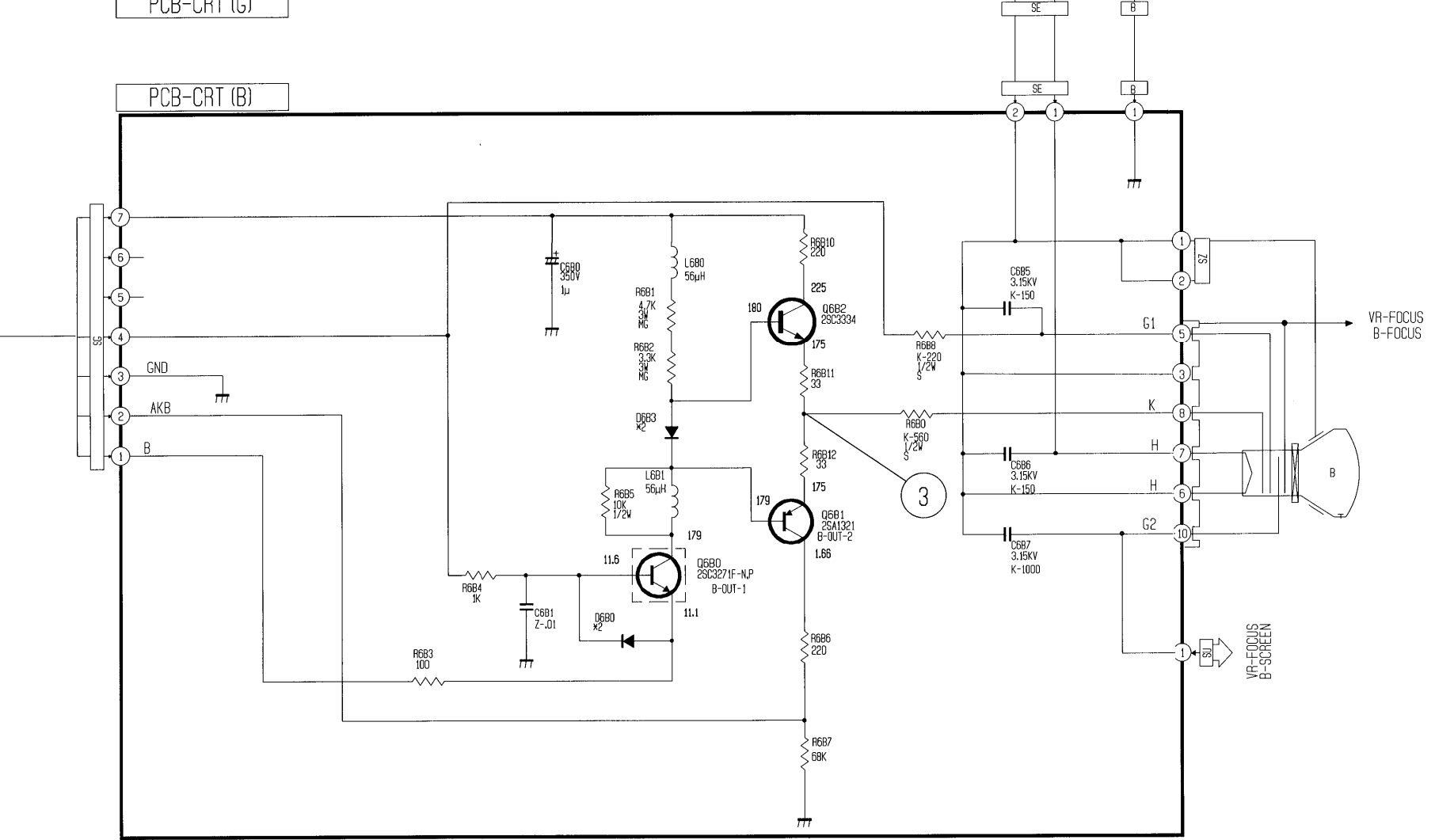
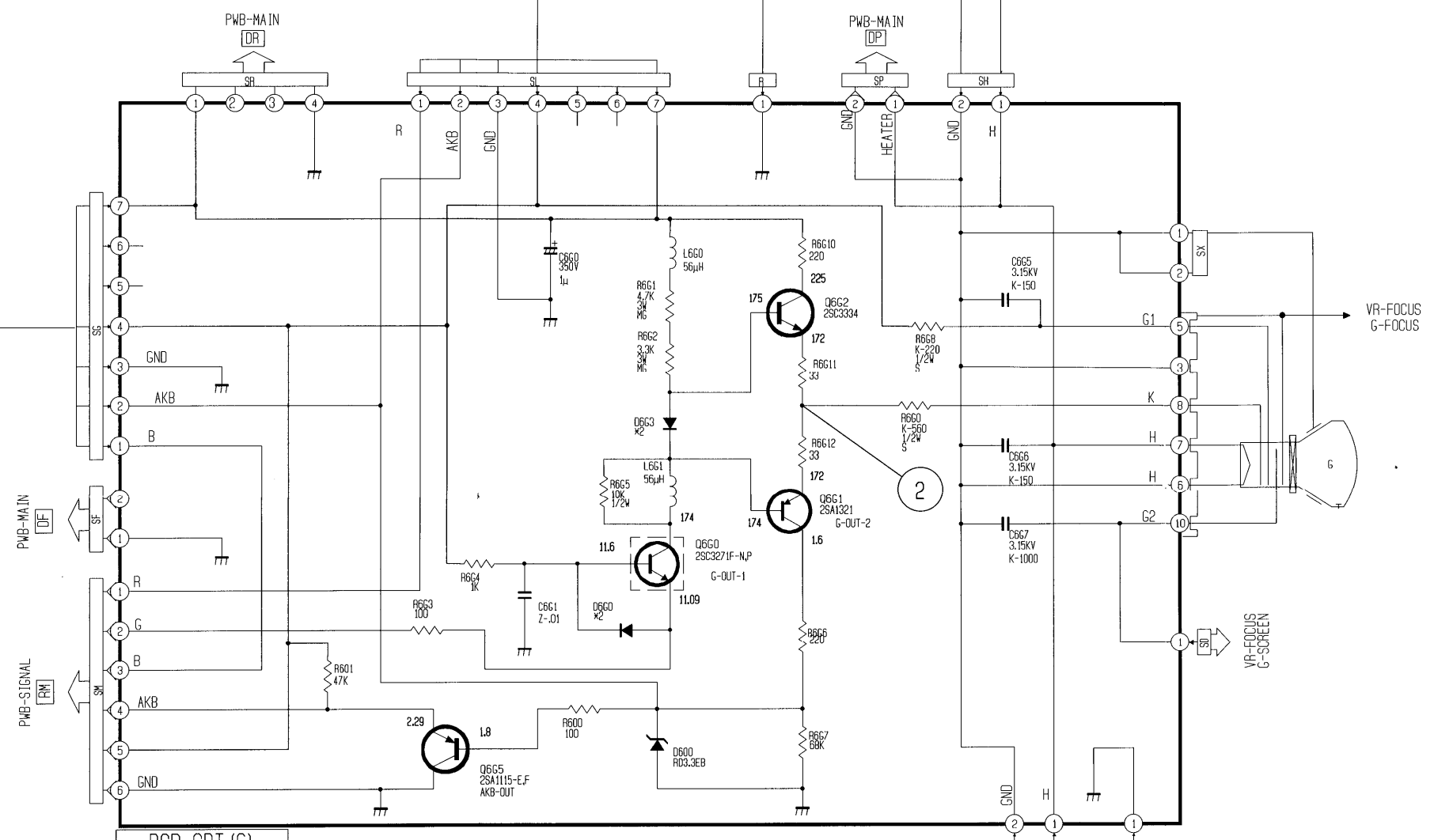
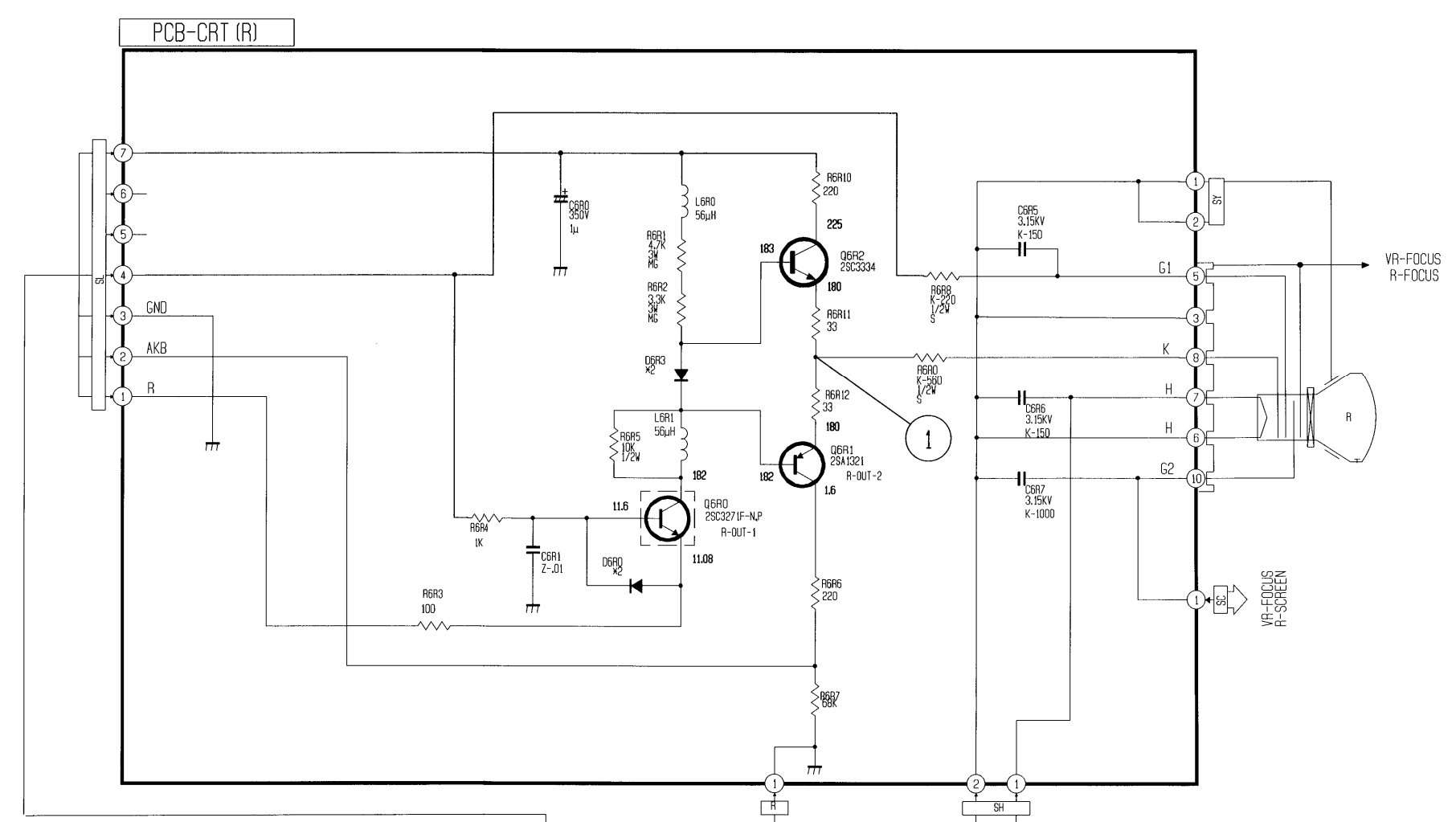
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4

5

6

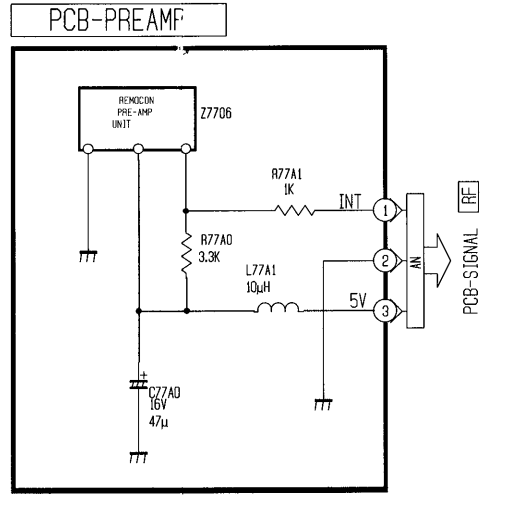
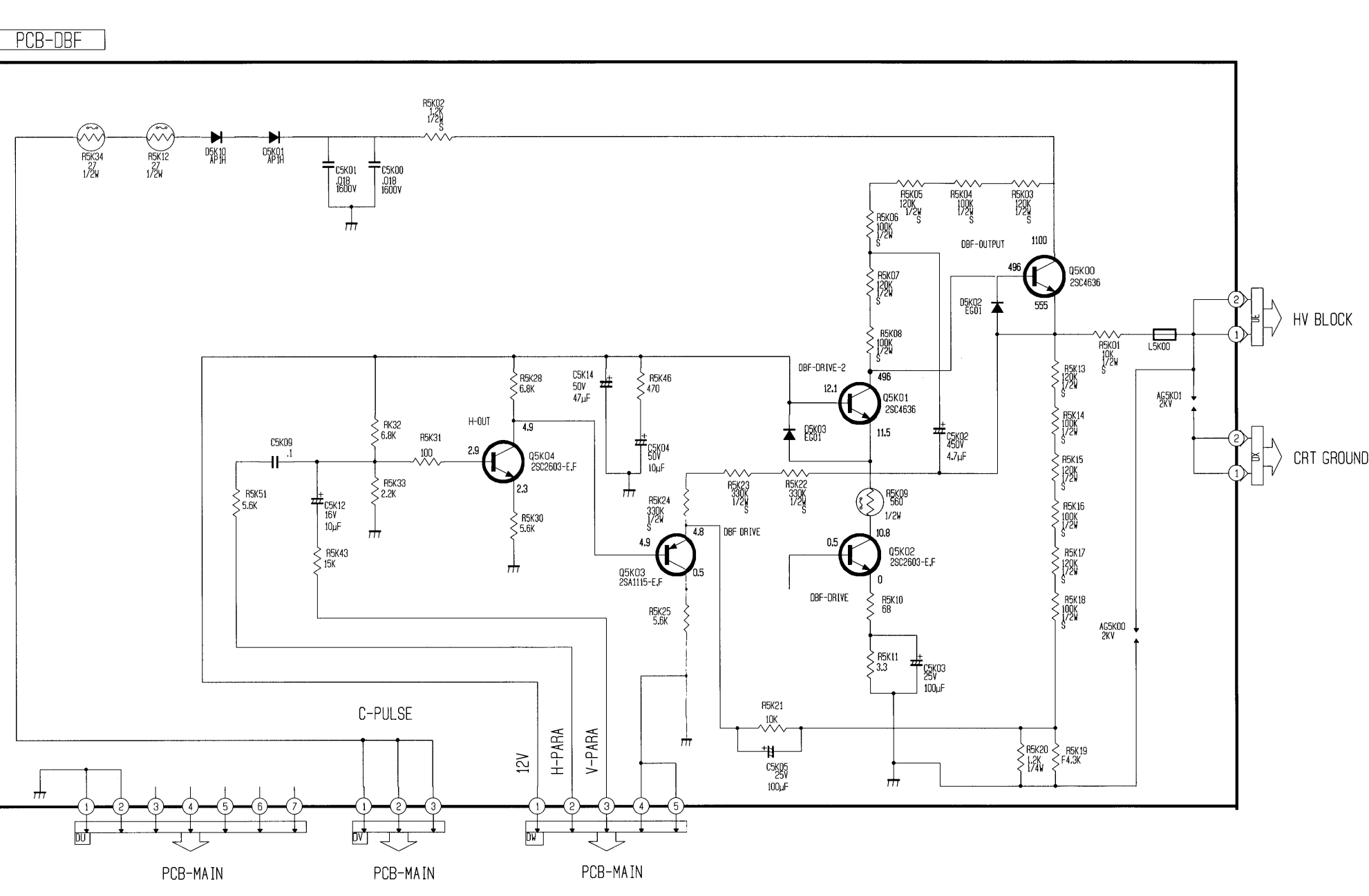
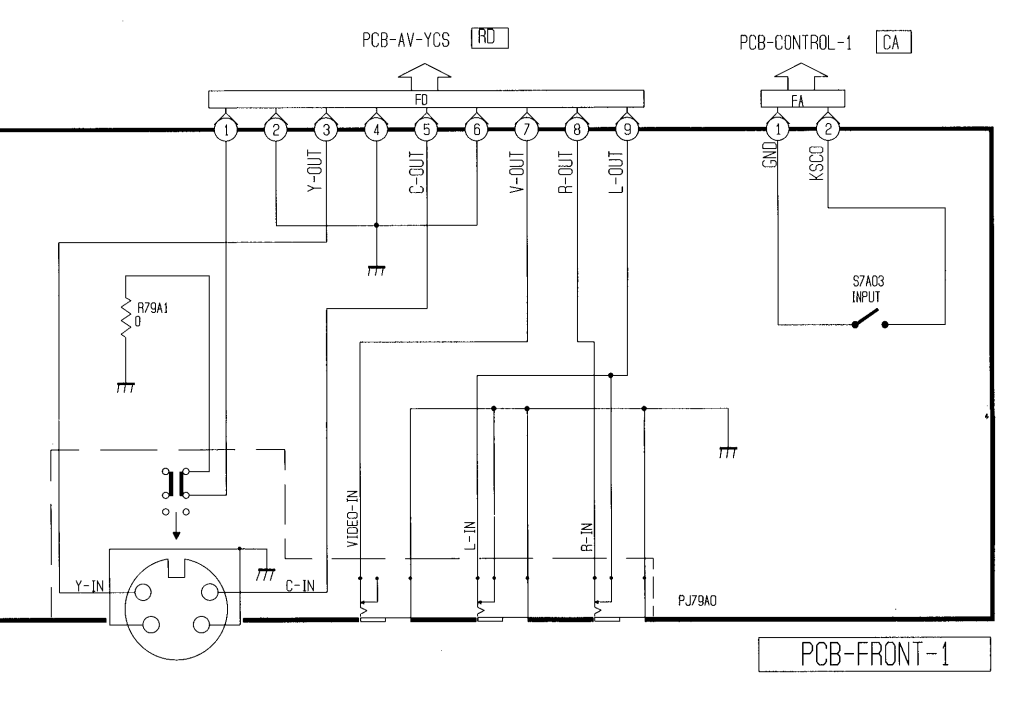
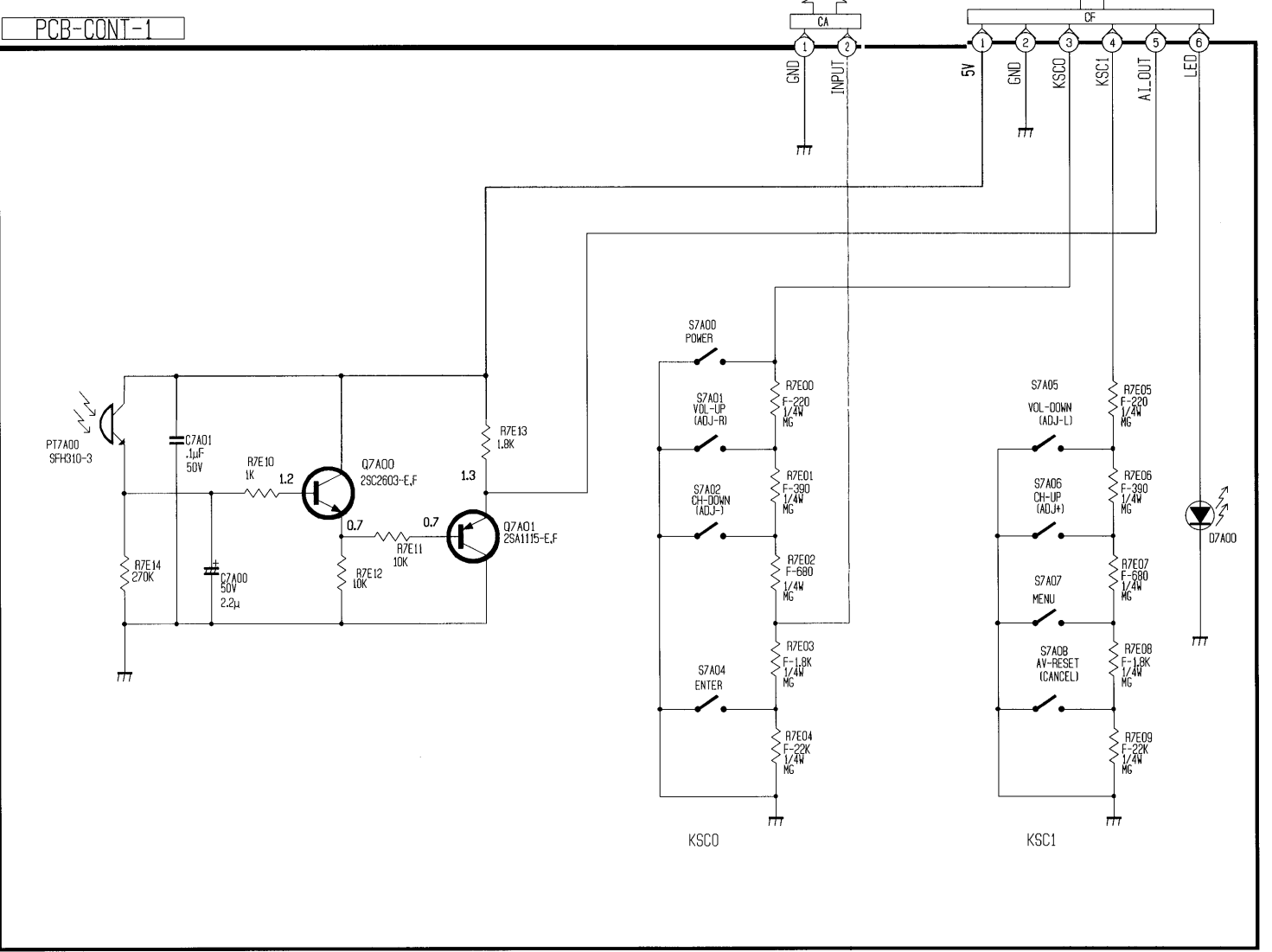
7



0000 X1: SS500/EN12/EN12-02K
X2: IS207A/IS2470M

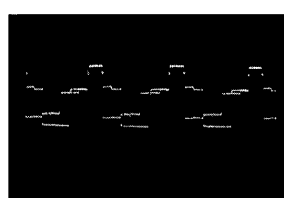
10

VS-45501
VS-45502
VS-45501A
VS-50501
VS-50502
VS-50502A



CONTENTS

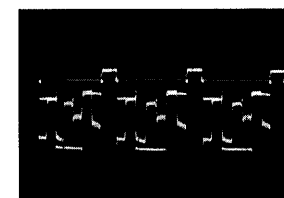
- PG. 1.....BLOCK DIAGRAM
- PG. 2.....MAIN
- PG. 3.....SIGNAL
- PG. 4.....FS
- PG. 5.....HF
- PG. 6.....SVM
- PG. 7.....AV/YCS
- PG. 8.....PIP/APT
- PG. 9.....CONV
- PG.10....DBF, CONT-1, FRONT-1, PREAMP
- CRT (R), CRT (G), CRT (B)



① 90V p-p (H)

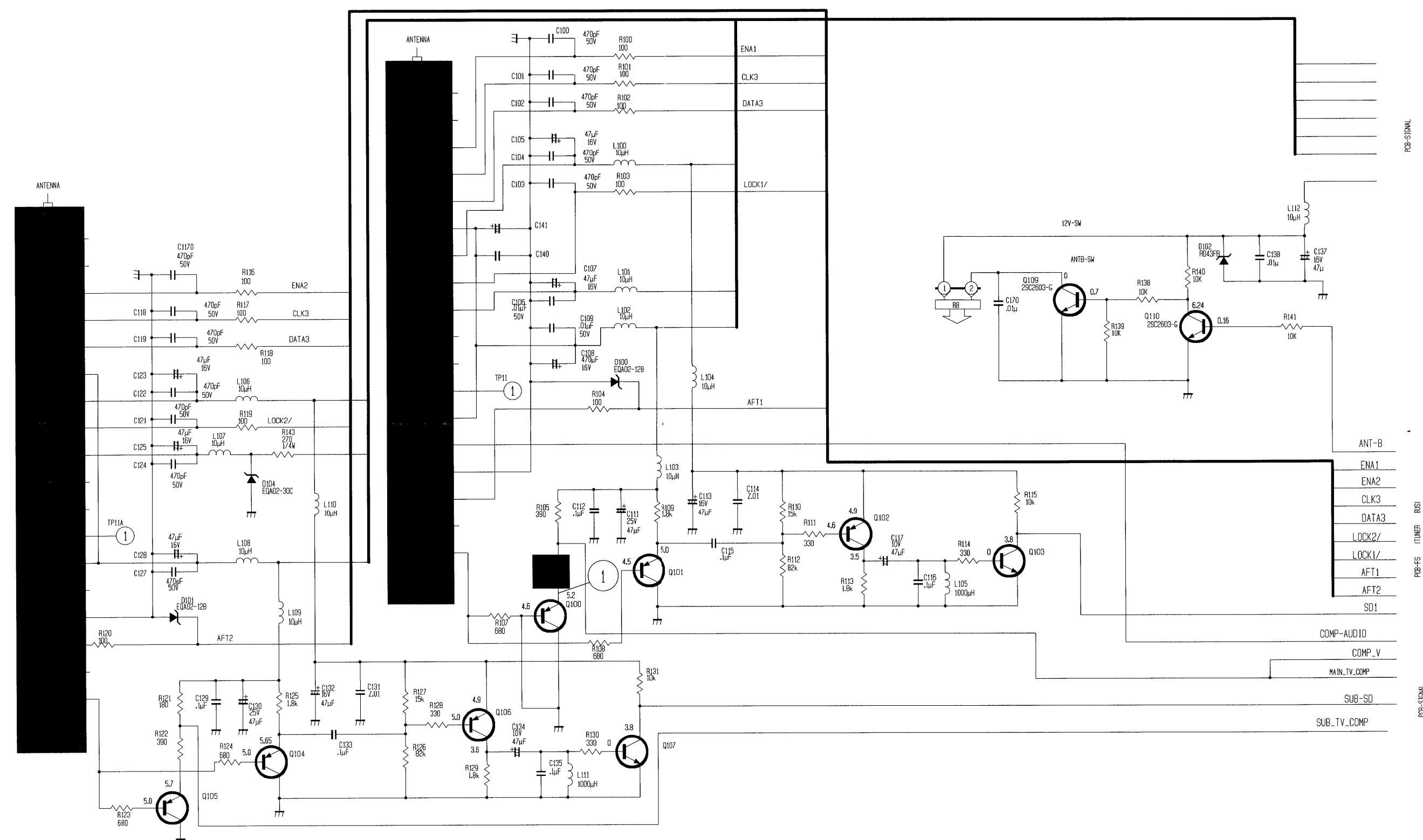


② 109V p-p (H)



③ 114V p-p (H)

PCB-HF



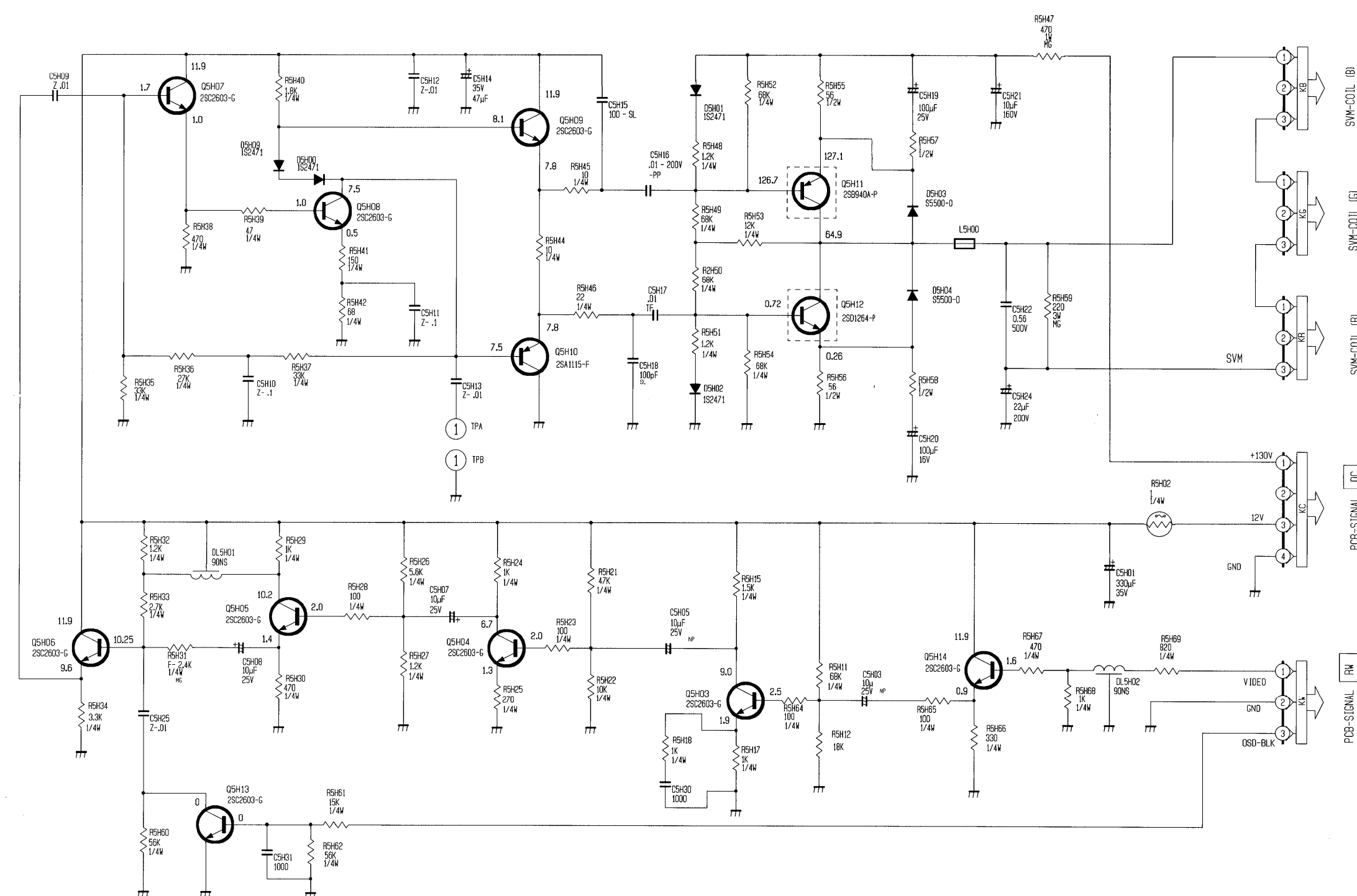
① 1.5V p-p (H)

CONTENTS

PG.1.....BLOCK	DIAGRAM
PG.2.....MAIN	
PG.3.....SIGNAL	
PG.4.....FS	
PG.5.....HF	
PG.6.....SVM	
PG.7.....AV/YCS	
PG.8.....PIP/APT	
PG.9.....CONV	
PG.10.....DBF, CONT-1, FRONT-1, PREAMP	
CRT (R), CRT (G), CRT (B)	

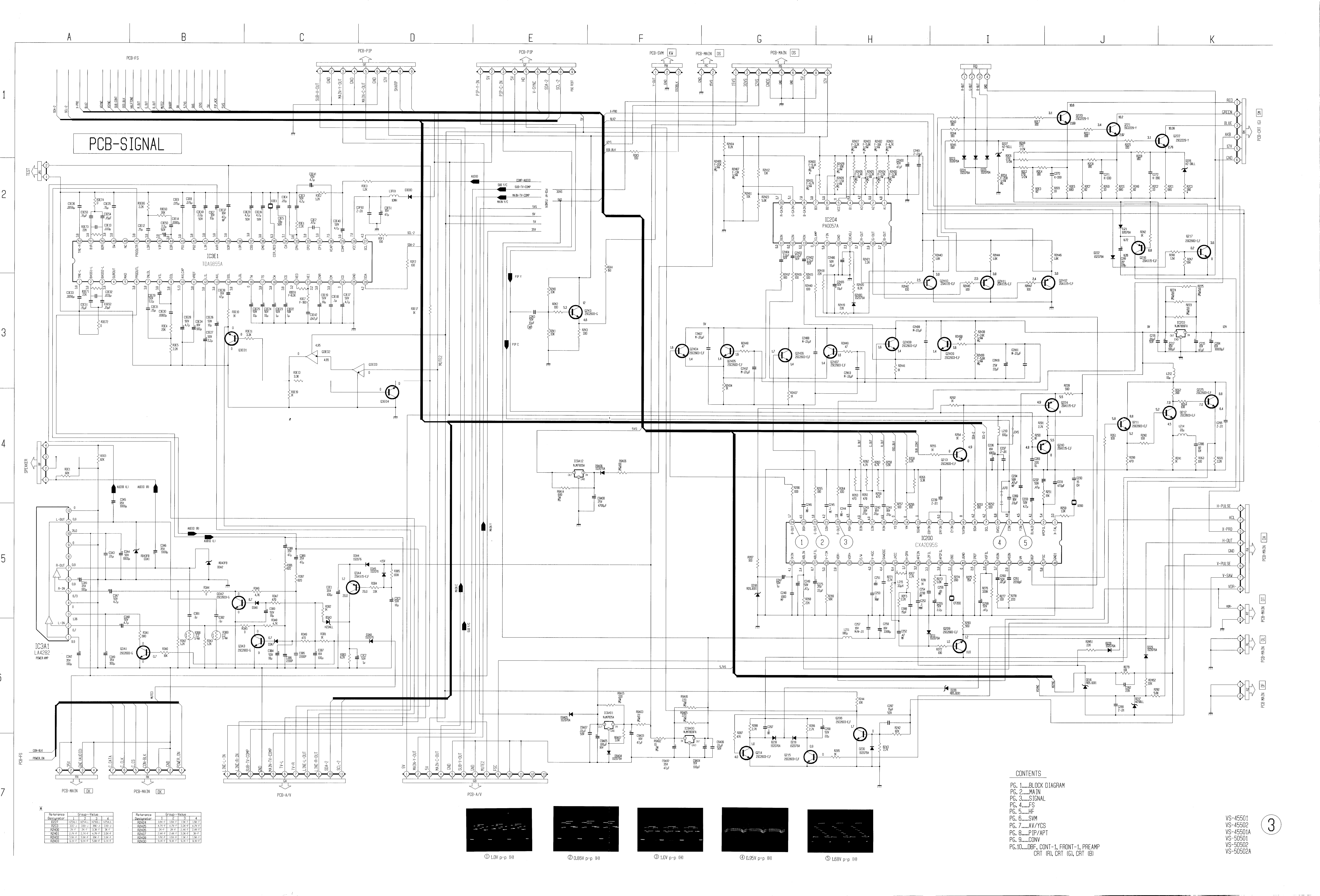
VS-45501
VS-45502
VS-45501A
VS-50501
VS-50502
VS-50502A

PCB-SVM

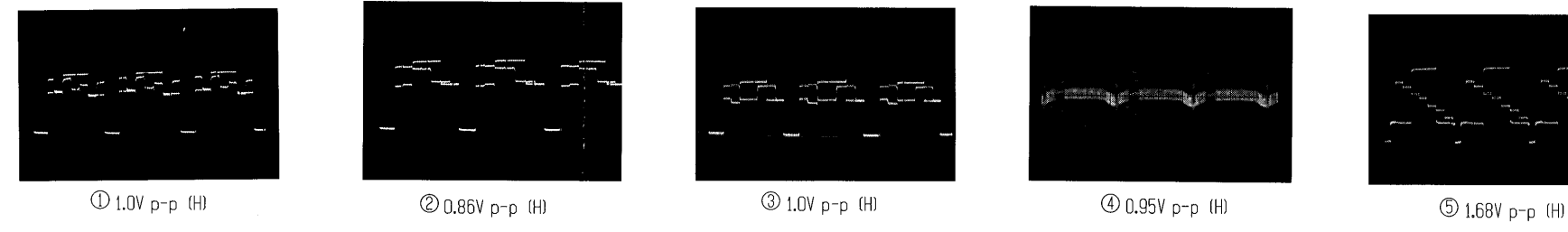


CONTENTS

- PG. 1.....BLOCK DIAGRAM
- PG. 2.....MAIN
- PG. 3.....SIGNAL
- PG. 4.....FS
- PG. 5.....HF
- PG. 6.....SVM
- PG. 7.....AV/YCS
- PG. 8.....PIP/APT
- PG. 9.....CONV
- PG.10.....DBF, CONT-1, FRONT-1, PREAMP
- CRT (R), CRT (G), CRT (B)



Reference	Designator	Value	Group	Value
R001	R001	10K	1	10K
R002	R002	10K	1	10K
R003	R003	10K	1	10K
R004	R004	10K	1	10K
R005	R005	10K	1	10K
R006	R006	10K	1	10K
R007	R007	10K	1	10K
R008	R008	10K	1	10K
R009	R009	10K	1	10K
R010	R010	10K	1	10K



CONTENTS

PG. 1.....BLOCK DIAGRAM

PG. 2.....MAIN

PG. 3.....SIGNAL

PG. 4.....FS

PG. 5.....HF

PG. 6.....SVM

PG. 7.....AV/YCS

PG. 8.....PIP/APT

PG. 9.....CONV

PG.10.....DOF, CONT-1, FRONT-1, PREAMP

CRT (R), CRT (G), CRT (B)

VS-45501

VS-45502

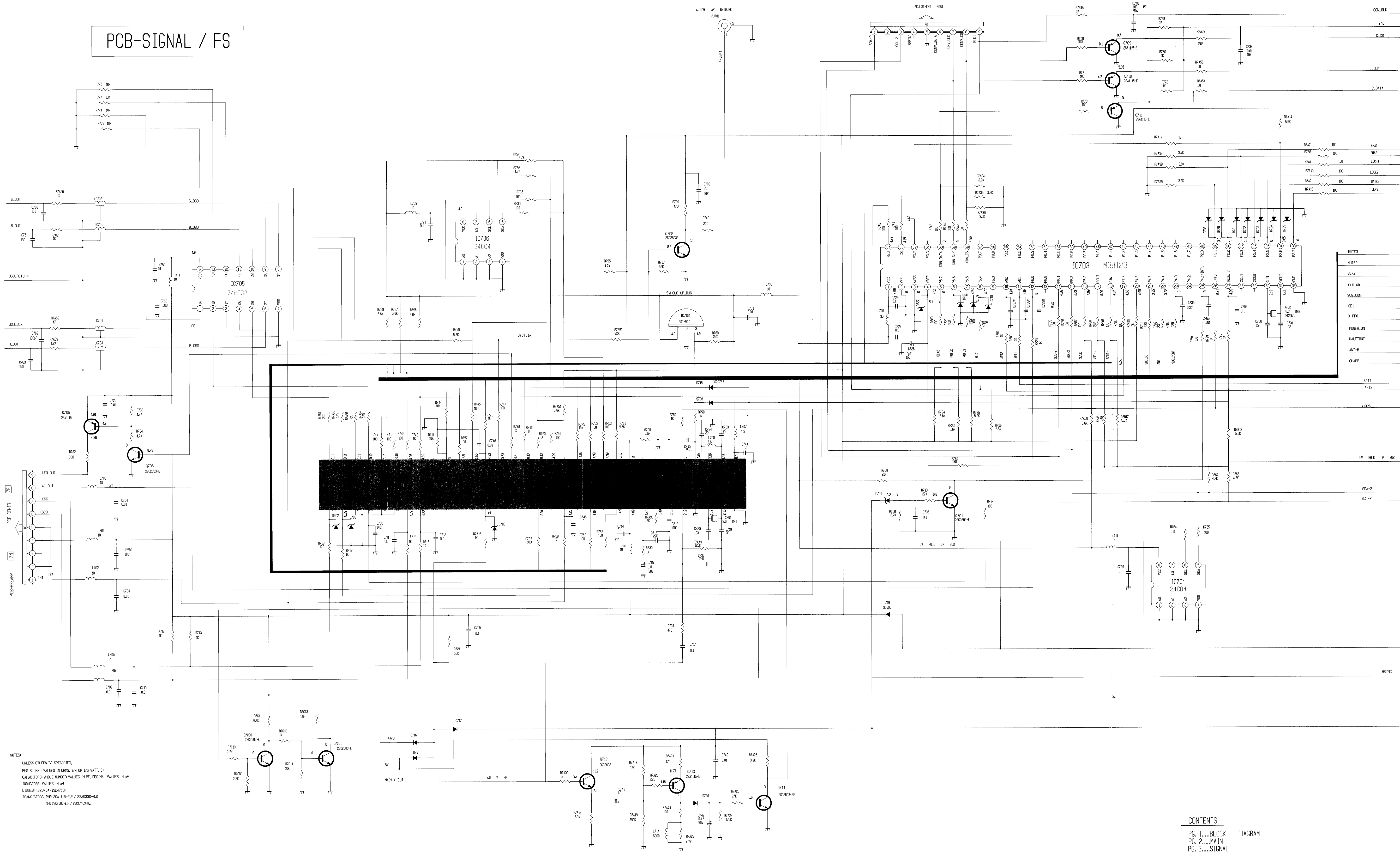
VS-45501A

VS-50501

VS-50502

VS-50502A

PCB-SIGNAL / FS



NOTES
UNLESS OTHERWISE SPECIFIED,
RESISTORS: VALUES IN OHMS, 1/4 OR 1/8 WATT, 5%
CAPACITORS: WHOLE NUMBER VALUES IN PP, DECIMAL VALUES IN UF
INDUCTORS: VALUES IN UH
DIMENSIONS: IS2076A/IS24710M
TRANSISTORS: PNP: 2SA1115-E / 2SA1115-E / 2SA1115-E
NPN: 2SC2003-E / 2SC2003-E

CONTENTS	
PG. 1.....BLOCK	DIAGRAM
PG. 2.....MAIN	
PG. 3.....SIGNAL	
PG. 4.....FS	
PG. 5.....HF	
PG. 6.....SVM	
PG. 7.....AV/YCS	
PG. 8.....PIP/APT	
PG. 9.....CONV	
PG.10.....DBF, CONT-1, FRONT-1, PREAMP	
CRT (R), CRT (G), CRT (B)	

4
VS-45501
VS-45502
VS-45501A
VS-50501
VS-50502
VS-50502A

MODELS: VS-45501, VS-45502, VS-45502A
VS-50501, VS-50502, VS-50502A

NOTES

1. DC voltages were measured from points indicated to the circuit ground with a high-Z voltmeter.
2. Waveforms were taken with standard color bar signal
3. TP13, etc. show Test Points
4. CAPACITORS

Value	Not indicated	PF, for numbers more than 1 μF, for numbers less than 1
Dielectric Strength	Not indicated : 50V	
Tolerance	Not indicated = ± 10% G = ± 2% J = ± 5% K = ± 10% M = ± 20%	No tolerance is indicated for electrolytic capacitors and ± 20% P = + 100% - 0% Q = + 30% - 10% R = + 200% - 0% S = ± 0.25PF D = ± 0.5PF F = ± 1PF G = ± 2PF
Type	I Parts except for chips	Not indicated: Ceramic capacitor MB : Polyester capacitor PP : Polypropylene film capacitor ALM : Aluminum electrolytic capacitor TF : Twin film capacitor SC : Semiconductor Ceramic capacitor MF : Metalized paper MPP : Metalized plastic film capacitor MME : Metalized polyester capacitor MPE : Polyester polypropylene film capacitor PS : Styroil capacitor TAN or TANT : Tantalum capacitor +H : Electrolytic capacitor NP : Non polarized electrolytic capacitor
	II Chips	Not indicated : Ceramic capacitor chip +H : Electrolytic capacitor NP : Non polarized electrolytic capacitor chip
Characteristic (only ceramic capacitor)	Not indicated CH, SL, etc.	: F or B (high dielectric percentage) : Temperature compensating types

5. RESISTORS

Value		
Wattage	Parts except for chips	Not indicated = 1/4W or 1/6W
	Chips	Not indicated = 1/10W
Tolerance		Not indicated = + 5% D = ± 0.5% F = ± 1% J = ± 5% K = ± 10%
Type	I Parts except for chips	Not indicated: Carbon resistor S : Fixed composition resistor MOB : Metal oxide film resistor (type B) CB : Cemented resistor W : Wire wound resistor M : Metal film resistor MPC : Metal plate cement resistor ML : Metal liner resistor
	II Chip	Not indicated = Chip resistor

6. This is a basic schematic diagram. Some sets may be subject to modification according to engineering improvement.

SHADED COMPONENTS HAVE SPECIAL CHARACTERISTICS
IMPORTANT TO SAFETY. BEFORE REPLACING ANY OF THESE COMPONENTS READ CAREFULLY THE PRODUCT SAFETY NOTICE IN THE SERVICE MANUAL.
DO NOT DEGRADE THE SAFETY OF THE RECEIVERS THROUGH IMPROPER SERVICING.

SERVICE TECHNICIAN WARNING
X--RADIATION PRECAUTION
THIS PRODUCT INCLUDES CRITICAL ELECTRICAL AND MECHANICAL PARTS ESSENTIAL FOR X--RADIATION PROTECTION.
TO AVOID POSSIBLE EXPOSURE TO X--RADIATION TAKE X--RADIATION PROTECTIVE MEASURES FOR PERSONNEL DURING SERVICING.
SEE SERVICE INSTRUCTIONS FOR SPECIFIED REPLACEMENT PARTS AND SERVICE ADJUSTMENTS.

CONTENTS

PG. 1.....BLOCK DIAGRAM
PG. 2.....MAIN
PG. 3.....SIGNAL
PG. 4.....FS
PG. 5.....HF
PG. 6.....SVM
PG. 7.....AV/YCS
PG. 8.....PIP/APT
PG. 9.....CONV
PG.10.....DBF, CONT-1, FRONT-1, PREAMP
CRT (R), CRT (G), CRT (B)

VS-45501
VS-45502
VS-45501A
VS-50501
VS-50502
VS-50502A

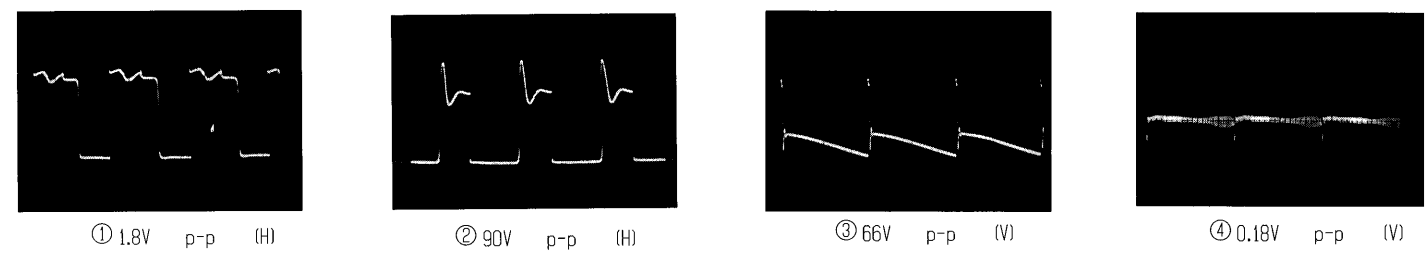


CONTENTS

PG.1....BLOCK	DIAGRAM
PG.2....MAIN	
PG.3....SIGNAL	
PG.4....FS	
PG.5....HF	
PG.6....SVM	
PG.7....AV/YCS	
PG.8....PIP/APT	
PG.9....CONV	
PG.10....DBF, CONT-1, FRONT-1, PREAMP	
	CRT (R), CRT (G), CRT (B)

2 VS-45501
VS-45502
VS-45501A
VS-50501
VS-50502
VS-50502A

All diodes marked K3 are 1S2076A



PCB-PIP

CONTENTS

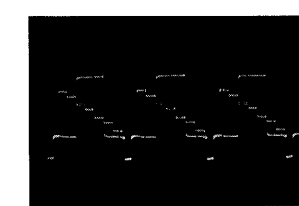
PG. 1....BLOCK DIAGRAM
PG. 2....MAIN
PG. 3....SIGNAL
PG. 4....IS
PG. 5....HF
PG. 6....SVM
PG. 7....AV/YCS
PG. 8....PI/P/PT
PG. 9....CONV
PG.10....DBF. CONT-1, FRONT-1, PREAMP
CRT (R), CRT (G), CRT (B)

VS-45501
VS-45502
VS-45501A
VS-50501
VS-50502
VS-50502A

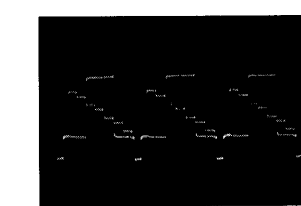
NPN	28C2003-EJ/28C1740B-RS
PNP	28A1115-EJ/28A8339-RS



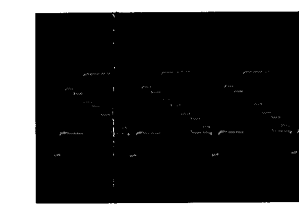
① 1.0V p-p (H)



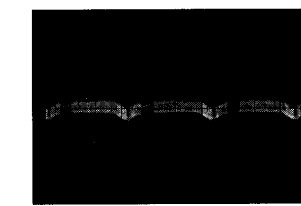
② 2.5V p-p (H)



③ 1.8V p-p (H)



④ 1.0V p-p (H)



⑤ 0.5V p-p (H)

